DOCUMENT RESUME

ED 398 363 CE 070 967

TITLE	Team Building [in HRD].
PUB DATE	Mar 95
NOTE	44p.; In: Academy of Human Resource Development (AHRD) Conference Proceedings (St. Louis, MO, March 2-5, 1995); see CE 070 958. For other conference symposia, see CE 070 959-981.
PUB TYPE	Speeches/Conference Papers (150)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Adult Education; Educational Research; Evaluation; Human Resources; *Labor Force Development; *Measures (Individuals); *Models; *Problem Solving; *Productivity; Systems Approach; *Teamwork

ABSTRACT

These five papers are from a symposium that was facilitated by Susan Dougherty at the 1995 conference of the Academy of Human Resource Development (HRD). "The Relationship between Productivity and Work Team Autonomy and Team Process Effectiveness" (Candice L. Phelan) reports that correlation analysis of results of a study of 21 work teams revealed a strong, significant relationship between productivity and process effectiveness and no relationship with autonomy. "A Team Assessment Instrument" (Jeff Allen) analyzes the reliability and validity of scores from a team assessment instrument, and reports study findings that indicate the reliability of instrument scores was adequate and an increase in the number of team members raised the reliability of instrument scores. "Developing a Systems Approach for Dysfunctional Teams" (David W. Wright, Paul E. Brauchle) depicts a systems model of interrelated steps that a team goes through to solve a work-related problem. "The Myth of Self-Directed Teams and the Ineffectiveness of Team Effectiveness Training: An Argument with Special Reference to Teams that Produce Knowledge" (Ann K. Brooks) argues that the failure of many teams to achieve their objectives is wrongly addressed by team-building interventions. "Successful Teams, But at What Level? An Evaluation Model of Team Success at an International High Technology Firm" (Oma Morey) examines how different stakeholders within an organization define success and develops a team success model from the literature and a case study of teams that yielded perceptions of success. (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 398 363

AHRD

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Helen J Allen
P Brauchle, A Brooks
O Morey
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ACADEMY OF HUMAN RESOURCE DEVELOPMENT

1995 Conference Proceedings

March 2-5, 1995
St. Louis, MO

[10] **TEAM BUILDING** Facilitator: Susan Dougherty, Center for Effective Power

The Relationship Between Productivity and Work Team Autonomy and Team Process Effectiveness
Candice Logue Phelan, Lockheed Missiles and Space Company, Inc.

A Team Assessment Instrument
Jeff Allen, University of North Texas

Developing A Systems Approach for Dysfunctional Teams
David S. Wright, Illinois State University
Paul E. Brauchle, Illinois State University

The Myth of Self-Directed Work Teams and the Ineffectiveness of Team Effectiveness Training: An Argument with Special Reference to Teams that Produce Knowledge
Ann K. Brooks, University of Texas at Austin

Successful Teams, But at What Level? An Evaluation Model of Team Success at an International High-Tech Firm
Oma Morey, University of Texas at Austin

CE070 967

BEST COPY AVAILABLE

The Relationship Between Productivity and Work Team Autonomy and Team Process Effectiveness

Candice L. Phelan
Lockheed Missiles & Space Company, Inc.

This study compared productivity of twenty-one work teams to team autonomy and process effectiveness. Correlation analysis indicated a strong, significant relationship between productivity and process effectiveness and none with autonomy. Multiple regression analysis indicated that the highest productivity was related to high process effectiveness combined with high autonomy. Emphasis on team process effectiveness such as team problem-solving, accurate feedback against goals, and the team's ability to focus on the future can help promote higher productivity.

United States organizations are increasingly emphasizing high involvement management in response to declining U.S. productivity and intense foreign competition (Sims and Manz, 1983). The trend toward greater employee involvement has been described in the popular literature since the early 1980s. Naisbitt (1982) cited the thrust toward participatory democracy as one of the ten most important trends affecting the U. S. This trend is part of a long-term evolution from early mechanistic management systems to more open, organic approaches to work design based on Systems Theory and the Socio-Technical Systems research of Trist, Bamforth, Susman, Brown, Kemp, Clegg, Wall, and Rice.

U. S. organizations may be "betting the farm" on employee involvement practices to regain a competitive posture, yet there is little data to provide confidence in this direction. Eighty percent of *Fortune* 1000 companies report using employee involvement practices (Lawler, Mohrman, & Ledford, 1992), however, there is little empirical evidence to determine which practices have the highest impact on productivity (Kahnweiler, 1991; Lawler, Mohrman, & Ledford, 1992; Macy, Norton, Bliese, and Izumi, 1990; Macy, Pearson, & Norton, 1989; Pearce and Ravlin, 1987; Wall, Kemp, Jackson, and Clegg, 1986). In a review of 294 articles on participative management published between 1976 and 1990, Kahnweiler (1991) found that only 22 percent of these were empirical in nature. In a review of 58 studies of work experiments, Cummings, Molloy, and Glen (1977) found that the research techniques used in these studies were not comparable with the standards established by quasi-experimental research designs.

Because of the lack of high quality research, many scholars are calling for more closely controlled studies (Cohen and Ledford, 1991; Kahnweiler, 1991) using a variety of work designs (Pasmore, 1988; Wall, Kemp, Jackson, & Clegg, 1986). The present study was designed to add empirical data to the body of knowledge on highly participative, team-based forms of work design, such as self-managing teams, that are being implemented throughout the U.S.

The intent of this study, therefore, is to determine if a relationship exists between work team productivity and the degree of work team autonomy and team process effectiveness.

Critique of Relevant Literature

Several bodies of research provide a foundation for the present study. First, the literature on the evolution of employee involvement from the closed, mechanistic approaches of Scientific Management (Taylor, 1911) to the organic philosophy of human relations approaches (Eoyang, 1980) defines the path to open organizations. Next, based on Open Systems Theory, the Open Organization Model provides a framework for examining the specific factors that impact

©*copyright, Candice L. Phelan, 1995*

individual, team, and organizational effectiveness. Third, the research on team structure illustrates the characteristics, strengths and limitations of team autonomy. And last, the literature on large-scale change provides a focus on how organizations respond to and are impacted by the need to change.

U. S. Evolution to Employee Involvement The changes from a control model represented by the mechanistic, bureaucratic approaches of the 18th, 19th and early 20th centuries (Morgan, 1986) to a commitment model of employee involvement portends a fundamental change in how organizations are designed and managed (Hackman, 1986). Bureaucracy as a form of organization was defined by sociologist Max Weber as one that "emphasizes precision, speed, clarity, regularity, reliability, and efficiency achieved through the creation of a fixed division of tasks, hierarchical supervision, and detailed rules and regulations" (Morgan, 1986, p. 24). This form of work design allowed an unskilled, rural, non-English speaking work force to cooperate to produce a high volume of a very complex product with consistent accuracy (Womack, Jones, & Roos, 1990). Because people "were considered inherently weak, lazy, avaricious, lustful, and disposed to evil" (Mink, Shultz, & Mink, 1979, p.4), this approach was designed to ensure order and fairness through a high level of command and control (Beer, Eisenstat, & Spector, 1990).

Although mechanistic systems may be effective when interchangeable skills are needed for a stable, predictable, machine-dependent environment, this form of organization can become a limitation in situations where adaptability, innovation, critical thinking, respect for individuals, and cooperation are important. "Clearly, we cannot use the organization of the 1890s to solve the problems of the 1980s" (Kanter, 1983, p. 43).

Changes in the U. S. labor force, patterns of world trade, new technologies, and politics altered work design requirements. As people began to think of work as more than merely a means for survival, new Human Relations theories emerged and the need for integrating the needs of individuals and organizations became a powerful force. Organizational psychologists such as Douglas McGregor, Fredrick Herzberg, and Chris Argyris "began to show how structures, work organizations, and leadership styles could be modified to create 'enriched,' motivating jobs that would encourage people to exercise their capacities for self-control and creativity.... Employees were now to be seen as valuable resources that could contribute in rich and varied ways to an organization's activities if given an appropriate change" (Morgan, 1986, p. 43).

Open Organization Model Based on Ludwig von Bertalanffy's Systems Theory, the open systems perspective "demands that we reconsider the nature of organizations and their evolution" (Pasmore, 1988, p. 3). Morgan (1986) describes three primary issues of Open Systems Theory: 1. Environment; 2. Interrelated subsystems; and, 3. Congruencies between different systems. Although Open Systems Theory constructs affect organizational structure, it is more concerned with organizational processes (Scott, 1977) and focuses on the goals, functions, and processes of self-organization (Mink et al., 1979).

Building on these concepts, the Open Organization Model (Mink et al., 1979) views the individual, the work group, and organization as a total system composed of subsystems and analyzes the effectiveness of these systems internally in relation to each other and in relation to the environment. The model provides a framework for change that provides a vision of organization potential and permits systematic diagnosis of organization growth needs.

Work Team Structure Employee involvement and team-based structures are not new. Decades of popular literature and management research focus on employee involvement programs, including quality circles, problem-solving groups, parallel organizations, labor-management committees, different rewards systems (Magjuka and Baldwin, 1991) and participative management (Kahnweiler, 1991). Employee involvement, defined as *the extension of power to make decisions, business information, rewards for performance, and technical and social skills to the lowest levels of the organization* (Lawler, 1986) is very common in the U. S. and tends to be implemented broadly rather than deeply.

Several key factors influence the change to high involvement structures: The focus on lean staffing, decentralized staff support, and maintaining flexibility and responsive service (Beer, Eisenstat, & Spector, 1990), all driven by changing environmental conditions.

There are strengths associated with *team-based* high involvement structures such as: Providing a source of improvement in work methods and procedures (Katz, Laughlin, & Wilson, 1990; Lawler, 1986; Trist, Susman, & Brown, 1977; Walton, 1977); increased attraction and retention (Beekun, 1989; Lawler, 1986; Trist et al., 1977; Walton, 1977); increased staffing flexibility (Lawler, 1986; Musselwhite and Moran, 1990); increased service and product quality (Katz, Laughlin, & Wilson, 1990; Lawler, 1986; Musselwhite and Moran, 1990; Versteeg, 1990); increased concern for quality (Cummings and Molloy, 1977); increased rate of output (Cummings and Molloy, 1977; Goodman, Devadas, & Hughson, 1988; Katz et al., 1990; Lawler, 1986; Musselwhite and Moran, 1990; and Versteeg, 1990); reduced need for staff support (Lawler, 1986; Musselwhite and Moran, 1990; Versteeg, 1990); reduced need for supervision (Lawler, 1986; Musselwhite and Moran, 1990), improved decision quality (Lawler, 1986); and finally, increased employee satisfaction (Cohen and Ledford, 1991; Rosenback and Zawacki, 1989; Trist et al., 1977; Wall et al., 1986).

The potential benefits are great, especially when the technology creates task interdependence (Lawler, 1986), however the potential for failure is also great (Hackman, 1986). There is no guarantee that work teams will produce the desired effects in any particular situation. An organization must make a major commitment in time, resources, and sheer faith when changing to a work team structure.

Changing to a Team-Based Structure Scholars are identifying conditions needed for effective implementation of team-based employee involvement (Hackman in Pallack, 1986; Kumar, Replogle, & Beyerlein, 1991) that focus on the structure and processes that enhance a team's ability to focus on its own goals, interact with its environment, and evaluate the outcomes of its actions.

The change to a team-based structure is representative of any system-wide change in which success is dependent of gaining the support and commitment of the stakeholders. Mink and Esterhuysen (in press) propose beginning at the work team level while supporting the individual. Beer et al. (1990) reviewed the process in six large corporations and concluded that problems occur when the organization focuses on culture or management, changes the formal structure first, relies on policies to implement the change, starts at the top, and targets core central operations. Successful cases demonstrate that management should concentrate on task alignment and the business's competitive challenges to motivate change.

Synopsis of the Methodology

This study examined the relationship between work team productivity and two variables: Team autonomy (or independence) and team process effectiveness. The correlational approach was selected because correlation coefficients "are best used to measure the *degree* of relationship between two variables and to explore *possible* causal factors that can later be tested in an experimental design" (Borg and Gall, 1989; p. 576). Although some scholars encourage the use of experimental or quasi-experimental techniques, Hackman (1985) suggested that using this approach in organizations may actually be misleading because of the interdependency of actions leading to productivity. Cummings, Mohrman, Mohrman, and Ledford (1985) cautioned that the use of traditional research techniques when studying organizational change can have unintentional consequences because of stronger threats to validity from not being able to closely control all the variables and conditions.

Research Questions Using a collaborative model of research design advocated by Lawler (1985) and Cohen and Ledford (1991), the researcher and the organization identified the issues and questions to study about team productivity, effectiveness, and employee involvement. Two research questions guided the study: 1. Is there a relationship between work team productivity and work team autonomy?; and 2. Is there a relationship between work team productivity and team process effectiveness?

To determine the degree of these relationships, if any, the productivity of 21 of 26 project teams from a southwest division of a Fortune 50 aerospace company was compared to measures of team effectiveness and team independence.

Sample The sample was identified as intact work teams within five major lines of business. Five of the targeted teams did not complete the study. Three were eliminated because they were newly formed and had little history on which the participants could base their assessments. The fourth team was eliminated because they were under a great deal of pressure to recover from program delays. One team that did participate in the study failed to code the two questionnaires correctly and was dropped. Based on this, there is no reason to assume a threat to external validity except for the possibility of the one team eliminated because of delays, however, this would have been only one team out of 22. The teams were very homogenous in nature, allowing for sound conclusions based on the results.

Measures Work team autonomy was measured through the use of a new instrument (Glaser, 1991) based on the work of Gulowsen (1971), a Norwegian social scientist. The instrument examines seven factors of team autonomy that are compatible with the research available to date on work team autonomy and measures the degree to which team members report being able to influence: Team goals, performance, production method, task assignment, membership, leader, and individual work operations.

Team process effectiveness was measured through completion of the Team Effectiveness Survey (Mink, Owen, and Mink, 1989) which is based on Culbert's task phase model and Open Systems Theory. This instrument measures team members' assessment of the following constructs: Having a common, clear sense of purpose, trust, valuing individual differences, effective feedback mechanisms and problem-solving systems, and the ability to let go of the past and focus on the next assignment.

A review of the norming processes, sub scale analysis, internal and external validity, and reliability data for each of the instruments indicated that these instruments would provide solid data concerning each of the constructs related to team autonomy and team process effectiveness.

This study employed a standard, objective measure of productivity that allowed a valid comparison of productivity across all teams in the study. This measure included each team's performance against the contracted cost and schedule commitments.

These measures were correlated using the Pearson r, which is appropriate when variables to be correlated are expressed as ratio data or interval data and is the most reliable estimate of correlation (Gay, 1987). Examination of the scatter diagrams indicated a linear relationship, thus not requiring the use of an eta ratio. A two-tailed test was used because no direction of the possible relationship was predicted.

Although, traditionally the lack of an experimental design might pose a threat to external validity by limiting the degree of generalization possible, respected scholars in the field of organizational change have suggested that a non-experimental design may not be a limitation; conversely, using an experimental design might actually pose the greatest threat. Hackman (1985) suggests that finding an organization that would allow researchers to enter the organization, randomly assign employees to groups, randomly assign conditions to those groups, and present any changes or outside influences during the study period would be such a rarity, that the results gained in this manner could not be generalized to any other organizations.

Content validity of the measures were supported by information in the literature and by the instruments' authors' explanation of the basis for selecting the measures of each construct.

Synopsis of the Findings

The analysis for each hypothesis is dependent on the relationship between the autonomy and process effectiveness constructs and productivity. Productivity was examined in three ways: (a) A general productivity index that combined cost and schedule performance; (b) cost performance; and (c) schedule performance. The general productivity index correlated highly with cost (.9679

p=.000) and slightly negatively, although not significant, with schedule (-.1831 p=.427). This indicates that the productivity index is primarily a reflection of the degree to which the team is on budget rather than a reflection of their schedule performance.

Table 1. Summary of Findings and Conclusions for Research Question 1. Productivity and Team Autonomy

Null Hypothesis Topic		CORRELATION r	CONCLUSION
Ho^{1a}	Influence volume of work (Goals)	.3507 P=.119	FAIL TO REJECT
$H_o{}^{1}b$	Establish team performance norms (Performance)	.0318 P=.891	FAIL TO REJECT
$H_o{}^{1}c$	Establish team prod. methods (Production)	.0323 P=.889	FAIL TO REJECT
$H_o{}^{1}d$	Assign tasks	.1634 P=.479	FAIL TO REJECT
$H_o{}^{1}e$	Select members	.1214 P=.600	FAIL TO REJECT
$H_o{}^{1}f$	Select leaders	.3415 P=.165	FAIL TO REJECT
$H_o{}^{1}g$	Individual work operations (Jobs)	.2041 P=.375	FAIL TO REJECT
$H_0{}^{1}$	**Combined: Team autonomy and productivity**	**.2540 p=.267**	**FAIL TO REJECT**

Autonomy Based on the correlations of the work team productivity index and each of the factors, or sub scales, there are no correlation coefficients that are below the .05 significance level, introducing too high a probability of a type I error. Power analysis indicated a much larger sample would be needed to support the two correlations found (establishing team goals and selecting a leader) that were lacking in significance. When cost and schedule performance were analyzed separately, no correlations were found to be significant. Based on this analysis, there is little effect size for work team productivity and team autonomy. Table 1 summarizes these findings.

Process Effectiveness The results of correlations of the process effectiveness sub scales point to a relationship between productivity and three process effectiveness constructs that are significant: Team problem solving (.5276 p=.014), feedback mechanisms (.4636 p=.034), the team's ability to let go of the past and move on (.3921 p=.079). The degree to which team members value individual differences (.3618 p=.107) and having a common, clear sense of purpose (.3376 p=.135) demonstrated a relationship but the significance level was not high enough to provide confidence of avoiding a type I error and the power analysis did not indicate that the low *n* might have masked an acceptable α. When cost and schedule performance was separated, cost performance was related to problem-solving (.5468 p=.010). Schedule performance, however, seemed to have little relationship with process effectiveness factors.

The strength of the relationship described between the productivity index and the process effectiveness sub scales indicates that the productivity index would also be correlated to the total mean scores for process effectiveness. This is indeed the case (.4652 p=.034). When considering the individual elements of productivity, process effectiveness is more highly correlated with cost

performance (.4350 p=.049) than to schedule performance (-.0203 p=.930). Table 2 summarizes the findings for the correlation of all sub scales with productivity.

Other Possible Variables To identify other possible variables that might be related to work team productivity, a qualitative measure was used to provide additional verification of the data collected. Each work team leader wrote two critical incident reports (before they were aware of the constructs being studied) describing a situation in which the team functioned effectively and a situation in which the team did not function effectively. They then described the role played by each of the constructs measured by the instruments, if any. A panel of experts in group processes analyzed the reports and identified themes that might be related to team productivity (budget and schedule achievement), determined which themes were already addressed by the instrument sub scales, and identified possible principles from the remaining themes that might also be related to work team productivity. Several possible additional constructs were identified that might be related to work team productivity: 1. External influences and integration with external systems; 2. Interaction of team members; 3. Responsiveness to customer expectations; 4. Demonstrated commitment and initiative; and, 5. Competitive spirit and a sense of challenge.

Table 2. Summary of Findings and Conclusions for Research Question 2. Productivity and Process Effectiveness

Null Hypothesis Topic		CORRELATION r	CONCLUSION
$Ho^{1}a$	Purpose	.3376 P=.135	FAIL TO REJECT
$H_o{}^{1}b$	Trust	.1300 P=.574	FAIL TO REJECT
$H_o{}^{1}c$	Recognize Individual Differences	.3618* P=.107	FAIL TO REJECT
$H_o{}^{1}d$	Feedback	.4636* P=.034	REJECT
$H_o{}^{1}e$	Group Problem Solving	.5276** P=.014	REJECT
$H_o{}^{1}f$	Celebrate & Move On	.3931+ P=.079	FAIL TO REJECT
$H_0{}^{1}$	**Combined: Team process effectiveness and productivity**	**.4652*** **p=.034**	**REJECT**

Implications for HRD Practice

Although HRD practitioners have long emphasized process effectiveness in helping teams achieve higher levels of productivity, U. S. business seems to be taking a "leap of faith" and betting on high involvement work design. The results of this study indicate that team autonomy alone is not related to team productivity. Although other studies (Cohen and Ledford, 1991) have identified relationships between productivity and team autonomy, the measures of productivity and autonomy were far more subjective. In the Cohen and Ledford study, productivity was a performance rating by the team's managers without controlling for the many

different possible interpretations and ratings among all the managers, a limitation cited by the authors. The productivity measure used in the present study, however, is the objective data from each project's status report for the same time period and ensures consistent application across all teams. It appears that HRD's emphasis on process effectiveness, however, is supported. It seems intuitive that teams making many of their own decisions will need higher levels of team process effectiveness.

Correlational analysis cannot determine causality. Although it seems reasonable that effective process skills, such as effective problem-solving, having effective feedback mechanisms to track progress toward objectives, and the ability to move out of the past and focus on the current tasks would contribute toward productivity, this might actually be reversed, with productivity acting as a driver of these constructs.

Implications for Future HRD Research

To eliminate other possible variables that might be related to productivity, future research might begin with the other possible constructs identified by the panel of experts from the critical incident reports. In addition, replication of this study would validate the findings that are contradictory to the direction of U.S. work design.

Although this is the first study of work team autonomy and productivity with professional, or "white collar" teams, others are needed to validate the application of these findings to other similar environments.

In addition, there were no empirical studies found that provided a longitudinal focus on work team productivity. This would add information on how to sustain productivity throughout all stages of a work team's life cycle.

Perhaps the most significant future research need illuminated by this study is additional exploration of productivity. One contribution made by this study was the use of a standard measure of productivity across teams. In-depth exploration of productivity factors such as cost and schedule performance as used in this study might provide a basis for increasing knowledge about productivity and its determinants.

There is no guarantee that high involvement work designs will produce the desired results in any given situation. Hackman (1986) suggested that autonomous teams are found on both ends of an effectiveness continuum, a prediction supported by this study. An effective work team can achieve a level of synergy and agility that could never be designed in by organizational planners and managers, however, a poor self-managing team would perform worse than a smoothly-functioning traditional unit.

References

Beekun, R. I. (1989). Assessing the effectiveness of socio-technical interventions: Antidote or Fad? *Human Relations,* 42(10), 877-897.

Beer, M., Eisenstat, R. A., & Spector, B. (1990). *The critical path to corporate renewal.* Harvard Business School Press.

Borg, W. R. & Gall, M. D. (1989). *Educational research: An introduction* (5th ed.). NY: Longman.

Cohen, S. G. & Ledford, G. E., Jr. (1991). *The effectiveness of self-managing teams: A quasi-experiment.* [Report no. G 901-6 (191)]. Los Angeles: Center for Effective Organizations, The University of Southern California School of Business Administration.

Cummings, T. G., Mohrman, S. A., Mohrman, A. M., Jr., and Ledford, G. E., Jr. (1985). Organization design for the future: A collaborative research approach. In E. E. Lawler III, A. M. Morhman, Jr., S. A. Mohrman, G. E. Ledford, T. G. Cummings and Associates (Eds.), *Doing research that is useful for theory and practice.* San Francisco: Jossey-Bass.

Cummings, T. G. & Molloy, E. S. (1977). *Improving the productivity and the quality of work life*. NY: Praeger.

Cummings, T. G., Molloy, E. S., & Glen, R. (1977). *A methodological critique of fifty-eight selected work experiments*. Human Relations, 30, 675-708.

Eoyang, C. K. (1980). Organization development: Structures, processes, or systems? In Cummings (Ed.), *Systems theory for organization development*. Wiley.

Gay, L. R. (1987). *Educational research: Competencies for analysis and application* (3rd ed.). Columbus, OH: Merrill.

Glaser, R. (1991). *How independent is our team? The Gulowsen autonomy scales*. (Available from Organization Design and Development, Inc. / 2002 Renaissance Blvd., Suite 100 / King of Prussia, PA 19406).

Gulowsen, (1971). *A measure of work group autonomy*. Oslo: Tanum Press.

Goodman, P. S., Devadas, R., & Hughson, T. G. (1988). Groups and productivity: Analyzing the effectiveness of self-managing teams. In J. P. Campbell, R. J. Campbell, and Associates (Eds.), *Productivity in Organizations*. San Francisco: 295-327.

Hackman, J. R. (1986). The psychology of self-management in organizations. In M. S. Pallak & R. O. Perloff, (Eds.). *Psychology and work: Productivity, change, and employment*. Washington DC: American Psychological Association.

Kanter, R. M. (1983). *The change masters*. NY: Simon and Schuster.

Kahnweiler, W. M. (1991). A review of the participatory management literature: Implications for HRD research and practice. *Human Resource Development Quarterly*, 2(3), 229-250.

Katz, A. J., Laughlin, P., & Wilson, J. (1990). Views on self-directed workteams from the line to the front office. *Journal for Quality and Participation*, December, 48-51.

Kumar, K., Replogle, S. H., & Beyerlein, M. (1991). Analyzing the effectiveness of autonomous work groups: Framework & longitudinal study. *Proceedings of the 1991 International Conference on Self-Managed Work Teams*. Published by the University of North Texas Interdisciplinary Center for the Study of Work Teams, 175-186.

Lawler, E. E. III. (1986). *High involvement management*, San Francisco. Jossey-Bass.

Lawler, E. E. III, Mohrman, S. A, & Ledford, G. E. (1992). *Employee involvement in America: An assessment of practices and results*. San Francisco: Jossey-Bass.

Macy, B. A., Norton, J. J., Bliese, P. D., & Izumi, H. (1990). Does change matter? The bottom line impact on new design and re-design. In, *The ecology of work conference proceedings*, Louisville, KY, June 28.

Macy, B. A., Peterson, M. F. & Norton, L. W. (1989). A test of participation theory in a work re-design field setting: Degree of participation and comparison site contrasts. *Human Relations*, 42(12), 1095-1165.

Magjuka, R. J. & Baldwin, T. T. (1991). Designing team-based employee involvement programs in a continuous improvement environment: An empirical investigation. *Human Resource Development Quarterly*, 2(3), Fall, 207-221.

Mink, O. G. & Esterhuysen, P. W. (In press). *Change at work*.

Mink, O. G., Mink, B. P., & Owen, K. Q. (1987). *Groups at work*. Englewood Cliffs, NJ: Educational Technology Publications.

Mink, O. G., Owen, K. Q. & Mink, B. P. (1989). *Analyzing team effectiveness*. Austin, TX: Somerset Consulting Group, Inc. 1208A Somerset Avenue.

Mink, O. G., Shultz, J. M., & Mink, B. P. (1979). *Developing and managing open organizations: A model & methods for maximizing organizational potential*. Austin, TX: Organization and Human Resource Development Associates, Inc.

Morgan, G. (1986). *Images of organizations*. Newbury Park: Sage.

Musselwhite, E., & Moran, L. (1990). On the road to self-direction. *Journal for Quality and Participation*, June, 58-63.

Naisbitt, J. (1982). *Megatrends: Ten New Directions Transforming Our Lives*. NY: Warner.

Pasmore, W. A. (1988). *Designing effective organizations: The sociotechnical systems perspective*. NY: Wiley.

BEST COPY AVAILABLE

Pearce, J. A. II & Ravlin, E. C. (1987). The design and activation of self-regulating work groups. *Human Relations*, 40(11), 751-782.

Scott, W. R. (1977). *Effectiveness of organizational effectiveness studies in New Perspectives on Organizational Effectiveness*, p.63-95, ed. P. S. Goodman and J. M. Pennings. San Francisco: Jossey-Bass.

Sims, H. P., Jr. & Manz, C. C. (1983). Conversations within self-managed work groups In Human Resources Productivity: *A National Productivity Review Reprint Series*. NY: Executive Enterprises.

Trist, E. L., Susman, G. I., & Brown, G. R. (1977). An experiment in autonomous working in an American underground coal mine. *Human Relations*, 4, 175-185.

Versteeg, A. (1990). Self-directed work teams yield long-term benefits. *Journal of Business Strategy*, 11, Nov.-Dec. 9-12.

Wall, T. D., Kemp, N. J., Jackson, P. R., & Clegg, C. W. (1986). Outcomes of autonomous workgroups: A long-term field experiment. *Academy of Management Journal*, 29(2), 280-304.

Taylor, F. W. (1911). *Principles of Scientific Management*. NY: Harper & Row.

Walton, R. E. (1977). Work-innovation at Topeka: After six years. *Journal of Applied Behavioral Science*, 13, 422-433.

Womack, J. P., Jones, D. T., & Roos, D. (1990). *The machine that changed the world*. New York: Rawson Associates.

A Team Assessment Instrument

Jeff Allen
University of North Texas

This study analyzed the reliability and validity of scores from a team assessment instrument developed by the researcher. Findings indicate the reliability of instrument scores is adequate with a reasonably small standard error of measurement (SEM). Findings indicate that increasing the number of team members raises the reliability of instrument scores and decreases the SEM more than increasing the number of instrument items. Findings also reveal a correlation of .807 between the traits of cohesiveness and performance.

Before beginning this paper, I would like to acknowlege the extraordinary efforts of my doctoral advisors at Penn State: Drs. David Passmore and Hoi Suen. Also, I would like to thanks my other committee members, Drs. Ken Gray and Bill Rothwell, for their contributions to my research. This papers is extracted directly from my thesis research (Allen, 1994) and is modified to fit within the space limitations provided in this document.

As organizations move to team-based environments they must be aware of the importance of the reliability and validity of their team assessment instruments. Organizations sometime believe that instruments that are sold to them are both reliable and valid. As results from this study show, reliability is very dependent on the size of the team studied. The validity of a complex assessment instrument, is an even more difficult to prove. As organizations move toward team-based compensation, they must be aware of measurement consequences.

Background

Teams are becoming more structured and more important to the functioning of successful organizations. Organizations develop teams of people to solve organizational problems or to improve organizational processes. A team that hopes to meet its goals sucessfully needs feedback from the organization on its progress toward organizational goals (Senge, 1990). Unfortunately, most organizations have few measures of team development and performance (Lanza, 1988), and thus experience difficulty in assessing success or failure.

Measures of team cohesiveness and performance are important components of assuring team progress and success (Bannick, Roach, and Salas, 1993). The team assessment instrument developed as part of this research measures these two team components.

Cohesiveness and performance should be defined to provide a context for the team assessment instrument scores. Team cohesiveness is measured according to the degree of members' motivation to remain in the group (Golembiewski, 1962), and work together toward team goals. Team performance is measured by the teams' accomplishment of defined goals, provision of a service to customers, or manufacturing of a product.

The reliability and validity of scores from a team assessment instrument developed by the researcher were analyzed in this research. The research measurement methods used to assess the team assessment instrument scores provide organizations with information that will help in their selection of this team assessment instrument for their team evaluation process.

© copyright, J. Allen, 1995

Purpose of the Study

The purpose of this study was to assess the reliability and validity of scores from a newly created team assessment instrument. Team assessment instruments reviewed as a part of this study did not provide statistical information on their reliability or validity with the published instrument. This study attempted to fill this gap in published team assessment research.

Research Questions

The following two research questions are answered in this study:

1. What is the reliability of the team assessment instrument scores? This question addresses individual instrument item reliability and the reliability of rater scores. Reliability was assessed through an analysis of team members' scores on the team assessment instrument.
2. What is the validity of the team assessment instrument scores? This question addresses construct validity, content validity, convergent validity, and divergent validity. Validity was assessed through an analysis of team members' scores on the instrument, supervisor scores on the instrument, and customer scores on the instrument.

Development of the Team Assessment Instrument

Subject matter experts were asked to assess 70 team cohesiveness and team performance items. The subject matter experts categorized 21 items as team cohesiveness items and 49 items as team performance items. These procedures are explained in the methods section.

Once divided, the 70 items were then developed into three instruments: "Team Assessment Instrument (team version)," "Team Assessment Instrument (supervisor version)," and "Team Assessment Instrument (customer version)." These instruments will be referred to hereafter as the team instrument, the supervisor instrument, and the customer instrument. The team and supervisor instruments included all 70 instrument items (cohesiveness and performance). The customer instrument contained only the 49 items classified as team performance items. The customer instrument allowed the customer to rate only team performance because of the limited interaction between the customer and the team.

Each of these three instruments used a Likert-type scale of one to five. One represented "strongly disagree," two represented "disagree," three represented "no opinion," four represented "agree," and five represented "strongly agree" for each of the individual instrument items. The first page of each instrument contained a description of its background and organization. This section was customized on each instrument for the intended audience. The back inside cover of each instrument asked for background information about the participant. This background information was used in the generalization of assessment results.

The team instrument was pilot-tested with 58 team members from one organization. This pilot study (Phase I) was conducted to test study procedures and check internal instrument reliability. The pilot study procedures are explained in the methods section.

The findings from the pilot study were positive for the study procedures and internal instrument reliability. Therefore, the researcher did not revise the instrument after the pilot study.

Related Literature

Total Quality Management and Team Assessment Many organizations are currently investigating total quality management (Benson, 1992; Gordon, 1992; Benson, 1993). Total

quality programs often focus on continuous improvement, customer satisfaction, benchmarking (Jacob, 1993), and teamwork (Deming, 1982; Benson, 1992).

Teams are a cornerstone of the total quality movement (Scholtes, 1988). Historically, American organizations have been hierarchical, with each level of an organization directing lower levels of the organization toward its goals. Within the total quality philosophies, individual members of the organization are made aware of its systems and strive to move it in the right direction through their individual efforts within the system (Deming, 1982; Senge, 1990).

Teams are a successful way for organizations to increase productivity in today's competitive market. Organizations such as Xerox, Procter & Gamble, General Motors, and Federal Express have increased productivity from 13 to 40 percent through the use of teams (Orsburn et al., 1990).

In 1992, eight out of ten organizations with 100 or more employees had teams in their organizations (Gordon, 1992). Benson (1992) states, "Experts are encouraged that two integral components of the TQM agenda - quality results and team performance - are more widely being embraced by U.S. companies" (p. 67). The American Society for Quality Control (1993) found that seven of ten employees identified team activities as part of a formal organizational quality program. Also, the American Society for Quality Control found a high correlation between issues that are important to the organization and those that are important to its teams.

As total quality philosophies evolve, teams are becoming more structured and more important to the functioning of a successful organization. Organizations are developing teams of people to implement positive changes within the organization. These changes may include more effective management of complex processes, rapid response to changing work demands, motivation of team members, higher quality decisions, commitment to carry out decisions, and increased cohesion of the team (Lawler, 1988). One problem such teams is the lack of measures of team successfulness (Galagan, 1992).

Team Assessment Research Team assessment instruments have been created and used by organizations. Organizations have created instruments that have been used internally or sold for use by other organizations. In some cases, these instruments have been published in the literature. These instruments published in the literature have not been accompanied by statistical data related to their validity or reliability.

The Team Handbook (Sholtes, 1988) is a reference guide that has been adopted by many organizations using teams in a total quality management environment. Since the statistical information for other team assessment instruments has not been published, Scholtes' theories of team development and his "recipe for team success" were used as a starting point in the development of the team assessment instrument items.

Research Methodology

Due to the space limitations of this publication, the author will not delve into the detailed statistical methods of this research. The data analysis procedures used to answer reliability and validity questions for the pilot study and data collection are discussed in this section.

Population The target population consisted of personnel in industrial organizations. The accessible population for this study consisted of personnel from three selected industrial organizations in central Pennsylvania. With assistance from the researcher, representatives from the participating organizations identified teams with 2 to 32 members, one supervisor for each team, and one customer for each team. All teams studied were active these participating organizations, and all teams had existed for two weeks to four years.

Sampling The sampling methodology was separated into three parts: sampling of individual team members, sampling of a team supervisor, and sampling of an internal or external customer of the team. Each sample, though collected once, could be used in more than one assessment of the instrument's reliability or validity. A selective sample of team members,

supervisors, and customers assured a balanced design and an even distribution of participants to effectively evaluate the team assessment instrument. Participants were chosen through the cooperative efforts of an organizational representative and the researcher.

Team Members. The sample of team members was drawn selectively from the population. The team member sample consisted of 2 to 32 individual team members from the organizations described in the population. Team member sampling was used to assess instrument reliability and validity.

Supervisors. The sample of team supervisors consisted of one supervisor from each of the teams described in the population for a total 32 supervisors. The organization's representative identified a team supervisor that could best assess team cohesiveness and performance. Supervisor sampling was used to assess instrument validity.

Customers. The sample of team customers consisted of one customer from each of the teams sampled from the population for a total 32 customers. The organization's representative identified a team customer (internal or external) that could best assess team performance. Customer sampling was used to assess instrument validity.

Reliability

Pilot Study A selected manufacturing organization identified five teams with 4 to 23 team members on each team for a total of 58 team members. The identified teams were active in the organization and were involved in various manufacturing and service activities. The pilot study was used to analyze the reliability of the items in the assessment instrument. Supervisor and customer sampling was not necessary for analyzing the internal instrument reliability in the pilot study.

Design of the Pilot Study Analysis Individual item reliability within the instrument, team member reliability, and team reliability were analyzed using GENOVA (Crick & Brennan, 1983). This GENOVA mainframe statistical program was used to determine internal instrument reliability and rater reliability. The program gives information similar to that provided by the classical approaches (Cronbach Alpha, standard error of measurement, Spearman-Brown, etc.). The advantage of the GENOVA program over these classical approaches is that it provides a flexible assessment of multi-faceted problem measurement errors that cannot be assessed through classical approaches (Suen, Lu, Neisworth, & Bagnato, 1993).

Universe of Admissible Observations Generalizability theory views assessment as a sequence of sampling within a defined setting (Suen, Lu, Neisworth, & Bagnato, 1993). The universe of admissible observations defines the scope of the generalizations that can be made from the assessment results. The scope cannot extend beyond this universe of admissible observations.

The universe of admissible observations for our cohesiveness results includes team member ratings and overall team rating of team cohesiveness as assessed by items 1-21 of the team instrument. The universe of admissible observations for the performance results includes the team member ratings, and team rating of team performance as assessed by items 22-70 of the team instrument. Item reliability of the instrument was studied, through GENOVA, using two identical designs to analyze the reliability of the two sections of the instrument (cohesiveness and performance).

Team members are specifically defined as members of the team being assessed. The team is specifically defined as the total number of all team members are identified by the organization and the researcher as an organizational team. Thus, the universe of admissible observations for the pilot study cohesiveness results includes only team member ratings and team rating of team cohesiveness as assessed through items 1-21 of the team instrument.

The items for the analysis of team performance are drawn specifically from all items related to team performance (22-70). Team members are specifically members of the team being assessed. The team is the total number of all team members identified by the organization and the

researcher as an organizational team. Thus, the universe of admissible observations from the pilot study performance results includes only the team member ratings and team rating of team performance as assessed through items 22-70 of the team instrument.

G-study Design Sources of score variation can be analyzed through GENOVA. A G-study attempts to identify measurement error in observed scores through analyses of the sample data within the universe of admissible observations. Two separate G-studies were used to analyze the measurement error in team cohesiveness and performance scores.

The assessment of the team instrument is multi-faceted. For each of its two sections (team cohesiveness and team performance), score variation can be attributed to true variance between teams (t), systematic variance across items (i), systematic variance between team members nested in teams ($m{:}t$), and/or variance due to an interaction of these dimensions. Symbolically, this score variation can be described as $(m{:}t)i$. This design will provide 1) true variance due to team rating of the team σ_t^2; 2) systematic error due to team member ratings within the team $\sigma_{m:t}^2$; 3) systematic error due to sampling of (cohesiveness or performance) items σ_i^2; 4) random error due to the interaction between the team ratings and items σ_{ti}^2; and 5) random error due to interaction among teams, team members, and items $\sigma_{(m:t)i}^2$. By comparing these components of variation, exact sources of error can be identified. Teams are considered the object of measurement in the design analysis; therefore, σ_t^2 should be relatively large and all other variance components should be relatively small. Individual score variation is explained using the following linear model:

$$\sigma_{(m:t)i} = \sigma_t^2 + \sigma_{m:t}^2 + \sigma_i^2 + \sigma_{ti}^2 + \sigma_{(m:t)i}^2 \qquad (1)$$

D-study Design For each of the G-studies (cohesiveness and performance), several decision study (D-study) scenarios were used to analyze instrument reliability in light of changes in the number of instrument items or the number of team members on each team. Reliability and error estimates were derived for each of these options.

In this reserach, team members (M) and instrument items (I) are considered random facets. To distinguish between the G-study design and the D-study design, lowercase subscripts are used for the G-study and uppercase subscripts are used for the D-Study.

Team members in the D-study are considered representative of those on the team. Items used in the D-study are considered representative of all items that can be used to assess the team (cohesiveness and performance).

Error estimates are described in the G-study and in the D-studies. In addition to these error estimates, each of the D-studies also estimates instrument reliability. The instrument reliability scores are interpreted through a relative model (norm-reference). Other error and reliability components described in the D-study scenarios are error variance $(\sigma^2(\delta))$, standard error of measure $(\sigma(\delta))$, and the G-Coefficient $(E\rho^2)$.

Pilot Study Decisions The objective of the pilot study was to determine whether increasing or decreasing either the number of instrument items or the number of team members on each team would increase the reliability of the instrument. If reliability was low, other options included rater training and/or limiting the population.

Rater training can be accomplished in two different ways. First, the rater can be given more detailed written instructions for the instrument. Second, the rater can be given a videotape that will teach him/her explains how to better rate the team through the team assessment instrument created for this study.

Placing a limit on the target population can be used as a last measure to increase the instrument reliability. By gathering background information from the participants, the researcher can identify areas of the population that have a low reliability score. Limiting the generalizability of instrument results increases the overall instrument reliability.

BEST COPY AVAILABLE

Data Collection Phase I of this study was a pilot study of a selected organization from the population. Phase II involved data collection from two other organizations. In each of these phases, data was collected for use in several analyses of reliability and validity. These sampling phases and the number of individuals involved in each sample are described in Table 1.

The data collection (Phase II) of the study followed the completion of the pilot study (Phase I). Most steps in the methodology of the data collection phase (for reliability) were identical to the pilot study with the exception of the number of team members involved in the data collection phase. This phase involved a selective sample of 29 teams from the population. Table 1 presents the distribution of team members in the reliability phase of the data collection. Limitations in GENOVA required a balanced number of team members on each team. For analysis purposes, five team members were selected randomly from each of 29 teams studied.

Table 1. Sample Distribution and Reliability Analysis Matrix

	Reliability	Validity	
Sample	GENOVA	MTMM	Factor Analysis
Pilot study (Phase I)			
Number of organizations	1	N/A	N/A
Number of team members before analysis	58	N/A	N/A
Number of teams	5	N/A	N/A
Number of team members in each team (for analysis purposes)	4	N/A	N/A
Number of team members (for analysis purposes)	20	N/A	N/A
Number of team supervisors	5	N/A	N/A
Total number of team customers	5	N/A	N/A
Number of participants in Phase I	68	N/A	N/A
Data collection (Phase II)			
Number of organizations	3	3	3
Number of team members before analysis	301	308	308
Number of teams	29	32	32
Number of team members in each team (for analysis purposes)	5	N/A	N/A
Number of team members (for analysis purposes)	145	308	308
Number of team supervisors	N/A	32	N/A
Number of team customers	N/A	32	N/A
Number of participants in Phase II	N/A	372	308

Note: MTMM = Multi-Trait Multi-Method Matrix

Validity

Subject Matter Experts The subject matter experts assessed the content and construct validity of instrument items. In assessing validity, experts placed the 70 items into two categories: cohesiveness and performance. Experts also assessed the representativeness of instrument items to the universe of items that should be asked of team members, supervisors, and customers to assess organizational teams.

In assessing the validity of the instrument questions, the subject matter experts assisted in two aspects of instrument validation. First they received a single envelope with 70 evaluation items on 70 separate strips of paper. Without the benefit of definitions, these individuals divided these items into two separate envelopes labeled team cohesiveness and team performance. Second,

the subject matter experts were asked to suggest revisions to any of the questions or to add questions that they believed should be represented in the assessment instrument. The items were categorized as cohesiveness or performance items through majority decision.

Multi-Trait Multi-Method Matrix Evidence of interpretation validity was demonstrated through the multi-trait multi-method (MTMM) matrix. This matrix was used to build divergent and convergent validity evidence and to show the internal reliability of a score in a single table.

The MTMM matrix uses terms found commonly in most statistical research, but they are used slightly differently in the analysis of the MTMM matrix.

A *trait* is defined as a characteristic of an object or person that is stable over time. Although a trait is considered a stable measure, the definition is not strictly followed in this application of the MTMM matrix. In many applications, a trait is loosely defined as an important measurable characteristic of an object. Researcher-defined traits should be as dissimilar as possible. This dissimilarity will allow better generalizability of the MTMM matrix results. The traits identified in this study are team cohesiveness and team performance.

A *method* is defined as the process of measuring the characteristics of an object or person. The methods of measure can be similar or dissimilar methods, though dissimilar methods will allow better generalizability of the MTMM matrix results.

"*Reliability* is the agreement between two efforts to measure the same trait, through maximally similar concepts" (Campbell & Fiske, 1959). This reliability definition is used in the MTMM matrix.

"*Validity* is the agreement between two efforts to measure the same trait through maximally different methods" (Campbell & Fiske, 1959). This validity definition is used in the MTMM matrix.

"*Convergent validity* is inferred from substantial correlation between same traits assessed by different methods" (Marsh, 1982). This definition of convergent validity is used in the MTMM matrix. Convergent validity shows the relationships of different methods of measurement by measuring the same trait.

"*Divergent validity* is inferred from substantial lack of correlation between different traits" (Marsh, 1982). This definition of divergent validity isused for the MTMM matrix. Divergent validity shows the lack of relationships between different traits.

Two "traits" were identifiedfor use in assessment of organizational teams: cohesiveness and performance. Three "methods" were identified to assess organizational teams: team member ratings, supervisor ratings, and customer ratings. By using this matrix, the researcher can show reliability scores, convergent validity scores, and divergent validity scores in a single table. The MTMM matrix was designed to provide the researcher with additional validity evidence.

The data collection used in the MTMM matrix included a sample of 308 team members, 32 supervisors, and 32 customers from the population (see Table 1). The interpretation of the MTMM matrix results (Campbell & Fiske, 1959) is provided in Table 2.

Table 2. Multi-Trait Multi-Method Matrix

Traits	Methods	A 1	A 2	B 1	B 2	B 3
A	1	r				
A	2	cv	r			
B	1	dv	dv	r		
B	2	dv	dv	cv	r	
B	3	dv	dv	cv	cv	r

Note: Traits = A - Cohesiveness; B - Performance
Methods = 1 - Team Score; 2 - Supervisor Score; 3 - Customer Score

Terms = r - Reliability
cv - Convergent Validity
dv - Divergent Validity

Factor Analysis

Factor analysis allows researchers to explore the relationship of individual items within an instrument to its content constructs (cohesiveness or performance traits). Using factor analysis, the researcher assessed item relationships to demonstrate the instrument's construct validity. The individuals involved in the factor analysis sample are described in Table 1.

In this research a confirmatory analysis model is estimated and evaluated. The model contains two latent variables that are described as cohesiveness and performance. Cohesiveness is described by items 1-21. Performance is described by items 22-70.

For the purpose of benchmarking, the two latent variable model is compared to an alternative model containing one latent variable described as teamwork. Teamwork is described by items 1-70. This one latent variable specification (teamwork) serves only as a benchmarking tool for analysis purposes and should not be considered a practical alternative model.

Estimation Parameters for the model are estimated through iterative unweighted least squares (ULS) techniques. These techniques minimize the models fit function by successively improving the parameter estimates (Jöreskog & Sörbom, 1984).

The fit function for maximum-likelihood (ML) is based on the assumption that the observed variables have a multinormal distribution. Under this assumption, the estimation of fit is most precise in larger samples.

Evaluation Several consistency checks were made to determine the appropriateness of item (items 1-70) attachment to two traits (cohesiveness and performances). These consistency checks were an adjusted goodness-of-fit index (AGFI), coefficient of determination, and root mean squared residual (RMR).

The adjusted goodness-of-fit index (AGFI) shows the discrepancy between the observed and hypothesized relationship among the item attachment to traits adjusted by the degree of freedom. The AGFI varies from zero to one, with values close to one indicating a stronger fit than those values nearer to zero (Jöreskog & Sörbom, 1984).

The coefficient of determination indicates how well the items serve to measure the latent variables of cohesiveness and performance. The coefficient of determination varies from zero to one. Coefficient values close to one indicate a good model (Jöreskog & Sörbom, 1984).

The root mean square residual (RMR) is defined as the average of variances and covariances of the residual matrix. Averages close to zero indicate small average differences in the correlations between observed measures and the hypothesized model (Jöreskog & Sörbom, 1984).

Findings and Discussion

What is the Reliability of the Team Assessment Instrument Scores? The findings of the team assessment instrument (cohesiveness and performance) indicated that the reliability of the instrument scores was adequate with a reasonably small standard error of measurement. Findings also indicated that increasing the number of team members raises the reliability of instrument scores and decreases the standard error of measurement (SEM) more than an increase in the number of instrument items.

What is the Validity of the Team Assessment Instrument Scores?

Subject Matter Experts. Without the benefit of definitions, subject matter experts were asked to categorize the instrument items into cohesiveness and performance categories. The experts unanimously agreed 51.4% of the time on the placement of an individual instrument item.

All other items were decided by a majority decision. Evidence of content validity was demonstrated by the experts' agreement on the placement of the 70 instrument items into the two categories of cohesiveness and performance.

After all of the questions were added or addressed, the experts unanimously agreed on the representativeness of the sample. Evidence of content validity was demonstrated by the experts' agreement on the 70 items used in the team assessment instrument created for this research.

Multi-Trait Multi-Method. Divergent validity correlations ranged between -.27 and .95. These correlation scores should be relatively close to zero. Therefore, evidence of divergent validity could not be inferred from the MTMM matrix.

Convergent validity correlations ranged between .20 and .80. These correlation scores should be relatively close to one. Therefore, evidence of convergent validity could not be inferred from the MTMM matrix.

Lack of convergent and divergent validity evidence in the MTMM matrix can be attributed to the high correlation between the two traits of cohesiveness and performance (.807). Although this correlation does not support the convergent and divergent validity findings in the MTMM matrix, their correlation shows the possibility of a relationship between the team cohesiveness scores and team performance scores on the created team assessment instrument. MTMM matrix results are provided in Table 3.

Table 3. Multi-Trait Multi-Method Matrix

Traits	Methods	A 1	A 2	B 1	B 2	B 3
A	1	.85				
A	2	.20	.89			
B	1	.23	.86	.93		
B	2	.33	.95	.80	.94	
B	3	-.27	.84	.55	.71	.94

Note: Traits = A - Cohesiveness; B - Performance
Methods = 1 - Team Score; 2 - Supervisor Score; 3 - Customer Score
Terms = r - Reliability; cv - Convergent Validity; dv - Divergent Validity

Factor Analysis. The adjusted goodness-of-fit indices, coefficient of determination, were adequately close to one with a reasonably small root means square residual. These findings led to the conclusion that the 70 items of the created team assessment instrument had been divided correctly into the two traits. This conclusion adds to the evidence for construct validity.

Factor analysis findings also indicated a correlation of .807 between the traits of cohesiveness and performance. This correlation led to the conclusion that the teams with high cohesiveness scores on the created team assessment instrument also were likely to have high performance scores.

References

Allen, J.M. (1994). *Assessment of the reliability and validity of scores from a created team assessment instrument.* doctoral dissertation, Penn State University, University Park.

American Society for Quality Control. (1993). Teaming up for quality: Employee attitudes on teamwork, empowerment, and quality improvement (item T732). Milwaukee, WI: ASQC.

Bannick, M.T., Roach, R.M., & Salas, E. (1993). Understanding team performance: A multimethod study. *Human Performance, 6*(4), 287-308.

Benson, T.E. (1992). Quality and teamwork. *Industry Week, 241*(7), 66-68.

Benson, T.E. (1993). Quality: If at first you don't succeed. *Industry Week, 242*(13), 48-59.

Campbell, D.T., & Fiske, D.W. (1959). Convergent and discriminate validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*(2), 81-105.

Crick, J. E., & Brennan, R. L. (1983). *GENOVA: A generalized analysis of variance system.* Iowa City, IA: ACT Publications.

Deming, W.E. (1982). *Out of crisis.* Cambridge, MA: Massachusetts Institute of Technology.

Dimock, H.G. (1987). *Groups: Leadership and group development.* San Diego, CA: University Associates.

Galagan, P.A. (1992). Beyond hierarchy: The search for high performance. *Training and Development, 46*(8), 21-25.

Golembiewski, R. T. (1962). *The small group: An analysis of research concepts and operations.* Chicago, IL: The University of Chicago Press.

Gordon, J. (1992). Work teams: How far have they come? *Training, 29*(10), 59-65.

Jacob, R. (1993). TQM: More than a dying fad. *Fortune, 128*(9), 66-72.

Jöreskog, K. and Sörbom, D. (1988). *LISREL 7: A guide to the program and applications* (2nd ed.). Chicago, IL: SPSS, Inc.

Lanza, P. (1988). Team appraisals. In A.D. Timpe (Ed.), *The art and science of business management performance* (pp. 258-265). New York, NY: KEND Publications.

Lawler, E.E., III (1988). *High Involvement: Participative strategies for improving organizational effectiveness.* San Francisco: Jossey-Bass.

Marsh, H.W., & Smith, I.D. (1982). Multitrait-multimethod analyses of two self-concept instruments. *Journal of Educational Psychology, 74*, 430-440.

Orsburn, J., Moran, L., Musselwhite, E., & Zenger, J. (1990). *Self directed work teams: The new american challege.* Homewood, IL: Business One Irwin.

Senge, P.M. (1990). *The fifth discipline: The art of the learning organization.* New York, NY: Doubleday Dell Publishing Goup.

Sholtes, P.M. (1988). *The team handbook.* Madison, WI: Joiner Associates, Inc.

Suen, H.K., Lu, C., Neisworth, J.T., & Bagnato, S.J. (1993). Measurement of team decision making through generalizability theory. *Journal of Psychoeducation Assessment, 11*, 120-132.

Developing A Systems Approach for Dysfunctional Teams

David W. Wright, Ph.D.
Paul E. Brauchle, Ph.D.
Illinois State University

High involvement and self-directed work teams often fail to complete important projects. This loss of productivity by dysfunctional teams prompted investigation. Multiple problem solving activities for 10 different high-involvement and self-directed teams in a mid-sized plant of a Fortune 100 company were analyzed for common traits. A systems approach to problem-solving activity by teams was developed and tested in actual work environments. Teams were found to go through stages of "Initiation", "Hibernation", and "Resolution". Intervention at the proper point in the Resolution phase was found to be successful.

High involvement work teams, where groups of workers actually participate in improving their work activities, are often seen by management as vehicles for improving productivity and quality in an organization (Axelrod, 1994; Brauchle and Wright, 1993). As a matter of fact, properly trained and guided work teams *can* lead an organization to higher productivity, better quality, and bigger profits (Anand, 1993; Bumbico, 1994). They do so by bringing a new perspective to problems and responding to them at the point of application. But sometimes the road to success is not that easy. Once started, teams do not always go straight to success. Sometimes they break down. They become side tracked. Their efforts become blocked (Ray, 1993). Then they stop working on solving problems and start to complain, giving management a biased impression of what they are really doing. When this happens, the system seems to break down and we wonder why we spent so much time and energy developing the teams if they aren't producing good results.

A systems model provides a processural description of a work team's activities. Bales (1950, 1970) found that groups go through three major stages: orientation, evaluation, and control. Fisher (1970) identified four phases that task groups go through in their development: orientation, conflict, emergence, and reinforcement. In each of these two explanations, task groups are progressing through their job responsibilities and communication activities from a recognizable beginning to an identifiable end.

Cragan and Wright (1995) traced a work group's stagic development through a group problem-solving road map; they explained that this process can occur for both zero-history groups and on-going work teams. Cragan and Wright further suggest that task work groups need to accomplish four major group outcomes: productivity;, consensus, membership satisfaction, and quality of work.

This article describes how a typical work team progresses through a project. It depicts a systems model of interrelated steps that a team goes through to solve a work-related problem. The model (See Figure 1) is a synthesis of many teams' goal attainment activities. It is divided into three major sections: (1) Initiation, (2) Hibernation, and (3) Resolution. Throughout these sections there are several critical stages where teams may be blocked. At these times it is important that supervisors, facilitators, and managers act immediately to help the teams address the problems so they can go back to their major function: making improvements in the work process that help the organization. Sometimes outside consultants, those who are helping the teams grow and develop as independent problem solvers, must help keep the teams on track. We prefer that supervisors, facilitators, and support staff assume that role. The following discussion shows why.

© copyright, Wright & Brauchle, 1995

BEST COPY AVAILABLE

Initiation

The first section in the system describes the process of *initiation*, in which the team takes on a project and conducts its initial problem solving activities. When a high involvement work team (HIWT) embarks on a project, it is usually with a great deal of enthusiasm and high hopes for success. Team members are glad to initiate action. They "brainstorm" the problem and suggest all kinds of possible solutions. They may use cause-and-effect diagrams, Pareto analysis, histograms, or graphs and charts to identify the primary cause of the defect or difficulty. Then they pose a possible solution, and identify those persons who most likely will be able to help them get the job done.

Often, a team will be working on a problem where they do not have sufficient technical expertise. They need extra help and information from "staff." These staff persons may be financial analysts, tool makers, engineers, or supervisors. They may be the head of production or even the plant manager — anyone, in fact, who has special knowledge or skills necessary to help solve the team's problem. It is to one or more of these staff people to whom the team passes on its request.

Because staff are usually quite willing to work with teams, they readily agree to help with the project. Usually this occurs when the staff member is an invited guest at a team meeting in which the project is spelled out and the staff person's part in it is described. The requested help may be for information or for action to acquire needed materials or supplies for the project. We have seen some teams request help with cost/benefit analysis. Others needed assistance from engineers when the project required a product or workplace modification or a change in product specifications.

Whatever the nature of the request, staff usually promise to "work on it." Often they set a date to report back to the team on their part of the project. At that time, the team can move to the next activity that is needed to bring the project to a conclusion. Sometimes this works very well. Staff members report back with the promised support: needed information, new specification sheets, purchase orders, or maintenance requests with anticipated completion dates. The team uses the information or material to put other segments of their plan into operation. They are well on the way to solving the original problem. But what happens when staff do not respond so well? What happens if they do not respond at all? To understand what effects staff response can have on work teams, we must turn to the second segment of the model.

Hibernation

The second phase is *hibernation*. The initiation phase has been an active one, with the HIWT and staff working on the problem. The phase is a passive one marked by its inactivity.

As we see in the model, the first thing to occur in the hibernation phase is the perception that no action is taking place. Frustration is building up among team members. As the team is not receiving feedback regarding its proposal, it attempts to take positive action by following up on the problem. The team starts to feel a condition we call "HIWT Stress" -nothing is happening and it is not uncommon for gripe sessions to take place. Comments by teams members such as "I told you nothing would happen" become commonplace.

The staff feels harassed and reacts negatively to the team even following up on the proposal. Staff members feel they just don't have the time to work on the latest HIWT item. After all, this isn't the hottest issue and it certainly doesn't rate that high on a supervisor's priority list! This is the point where HIWT facilitators and champions need to enter the fray and help teams bring the project to conclusion. Obviously, the team needs to communicate to the facilitator that the team needs help. After all, it is in the best interest of the team and the organization to move out of the *hibernation* phase. After the facilitator becomes aware of the team's inactivity, he or she should be ready to do three things: (a) indicate his or her readiness to help the team, (b) take time to genuinely understand the problem, and (c) be willing to accept responsibility on

BEST COPY AVAILABLE

behalf of the team's effort. When we have seen the facilitator endorse the above three items, we have typically seen movement from *hibernation* to the next phase, that of *resolution*.

Resolution

If there is no action or resolution after the facilitator has become involved, both the team and the facilitator become frustrated. At this juncture of the *resolution* phase, consultants "prop up" the teams. What we suggest is that the consultants do the following: (a) talk to the facilitator, (b) talk to the team, and (c) talk to management. Consultants need to clarify and focus on the nature of the conflict on ideas not on people. After all, the conflict that is occurring over the probable completion of a given HIWT project is caused in most cases by competing time constraints and finite resources. The consultant's major role in "propping up the teams" is to lessen any personality conflicts that may be present and give overall encouragement for completion of the project.

The team presses on at this point. The team must recognize that the project can indeed expire at this critical moment. The team must reaffirm its position that it will not give up. A few things the team may now do include looking at a problem differently or utilizing a different approach for solving the problem. For example, a HIWT may communicate with another team in the plant on how they resolved a similar problem. Will this approach work in the current situation? Obviously adequate resources and support are essential, but they may not be sufficient in and of themselves. Good achievement may require adjustments to requirements of the next FY budget. The project may in fact have to be postponed for a year. Ultimately the current project will be completed and the team will already be initiating action on a new project. In most cases the new project will again have to move through the *initiation*, *hibernation*, and *resolution* phases.

Conclusion

What does this approach suggest to its various constituencies? managers? support staff? high involvement work teams? For one thing, it is highly pertinent for organizations if they truly want to adapt to changes in the organizational culture. Are people willing to provide more assistance along the way as teams undertake projects to help the company? Is there a sense of cooperation? Are individuals willing to sacrifice some of their personal goals for the good of the organization?

Although the model captures in a linear sense what is happening, should not organizations provide more feedback and become interactive? If HIWTs are to succeed, they don't always need to go through every step as indicated in the model in fact, they shouldn't. And what about achieving organizational outcomes - productivity, quality, group pride, and customer satisfaction? If organizations are truly to adapt and achieve these outputs, an understanding of the system that is portrayed in this model is a good initial step.

References

Anand, K. (1993). Eliminate shop floor defects with cross-level teamwork. Quality Progress. 26(7), 45-47.

Axelrod, R. H. (1994). Making employee participation work. Quality Progress. 27(4), 39-42.

Boles, R. F. (1950). Interaction Process Analysis. Reading, MA: Addison-Wesley.

Boles, R. F. (1970). Personality and Interpersonal Behavior. New York: Holt, Rinehart, and Winston.

Brauchle, P.E., and Wright, D.W. (1993). Training work teams. Training and Development. 47(3), 65-68.

Bumbico, A. S. (1994). Employee involvement impacts results - a case study. Performance and Instruction. 33(5), 3-6.

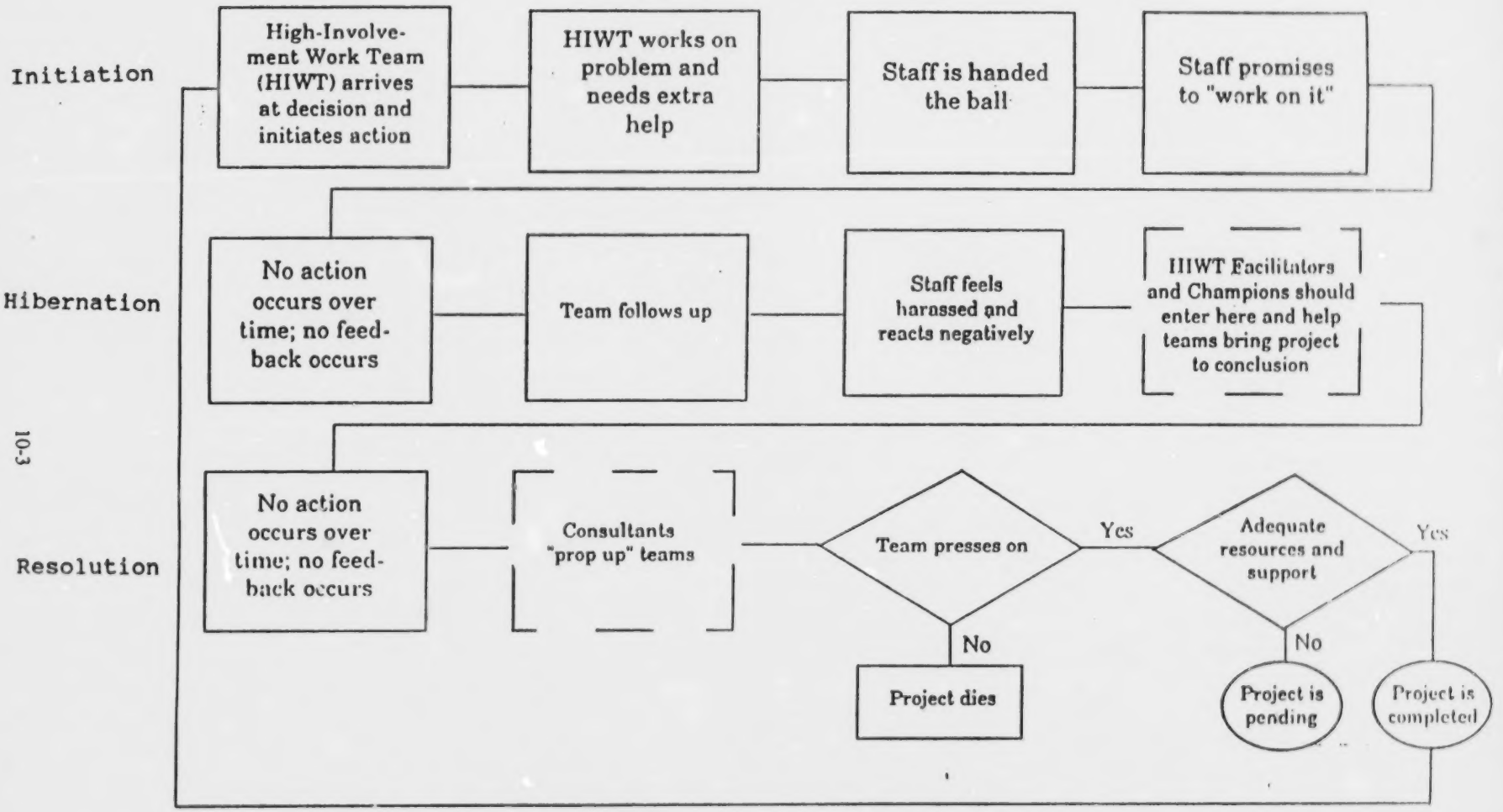
Cragan, J. F. and Wright, D. W. (1995). Communication in Small Groups: Theory, Process, Skills. St. Paul, MN: West.

Fisher, B. A. (1970). Decision-emergence: Phases in group decision-making. Speech Monographs. 370, 16-22.

Ray, E. B. (1993). When the links become chains: considering dysfunctions of supportive communication in the workplace. Communication Monographs. 60(1), 106-111.

A Systems Approach for Dysfunctional Teams

©P. Brauchle and D. Wright, 1993


Initiation
High-Involvement Work Team (HIWT) arrives at decision and initiates action
HIWT works on problem and needs extra help
Staff is handed the ball
Staff promises to "work on it"
Hibernation
No action occurs over time; no feedback occurs
Team follows up
Staff feels harassed and reacts negatively
HIWT Facilitators and Champions should enter here and help teams bring project to conclusion
Resolution
No action occurs over time; no feedback occurs
Consultants "prop up" teams
Team presses on
Yes
Adequate resources and support
Yes
No
No
Project dies
Project is pending
Project is completed

The Myth of Self-directed Work Teams And The Ineffectiveness of Team Effectiveness Training: An Argument With Special Reference To Teams That Produce Knowledge

Ann K. Brooks
University of Texas at Austin

The purpose of this paper is to argue that the notion of self-directed teams is a myth that is part of the dominant cultural pattern of competitive individualism in the United States. I additionally argue that the failure of many teams to achieve their objectives is wrongly addressed by team-building interventions. Focusing on knowledge producing teams in particular and drawing on research data, I will argue that team boundaries are so permeable and team membership so fluid that teams cannot help but reproduce the culture of the parent organization which in turn reproduces the dominant cultural patterns within the United States. The most important of these patterns as it effects teamwork is competitive individualism. Team-building interventions which wrongly problematize team members focus on personal awareness and group interaction skills while ignoring the organizational context which not only directs team task and implementation, but reproduces competitive individualism among team members. Although these interventions may temporarily introduce countercultural behavior such as trust among team members and promote the illusion of team goals, they do not address the influence of the dominant culture of the parent organization on team functioning.

Team Learning

The team learning process is one of working with information.

Recent grounded theory research has suggested that team learning can be functionally defined in terms of the knowledge production process: the gathering, sharing, and recombining of information, and its dissemination as new knowledge (Brooks, 1994). Similarly, from the field of psychology, Larson and Christensen (1993) define social cognition as social processes that relate to the acquisition, storage, transmission, manipulation, and use of information for the purpose of creating a group-level intellectual product. Although increasing numbers of Americans work with knowledge and knowledge appears to benefit from multiple contributors, very little research has been done on the process of group knowledge production. The few existing studies indicate that team learning includes many of the same processes individual learners use (Dechant, Marsick, & Kasl, 1993), information transfer is important (Ancona & Caldwell, 1990; Allen, 1984; Kraut, Egido and Galegher, 1990; Pelz & Andrews, 1966; Cicourel, 1987, 1990; Austin & Baldwin, 1991) and that an open and interactive climate seems essential to the process (Cicourel, 1990).

Power inequalities negatively influence the process of dealing with information.

Most recently, Brooks (1994) has suggested that formal and informal power inequalities among team members negatively influence the knowledge production process by limiting the participation of those with limited power (Brooks, 1994). This study of four teams in a research and development lab suggested that patterns in the organization's culture made it difficult for team members to gather, share, and work with information, and to disseminate new knowledge to others in the organization. In essence, contrary to the belief imbedded in the use of teams as a structural way to transform organizations so that they are flatter and more participative, the teams in this study reproduced the formal and informal hierarchical structure and culture of the traditional organization. Engineers dominated the knowledge production process on the teams, as did white men. Non-professional and non-management workers participated comparatively less. Engineers served as the team leaders and dominated discourse on all four teams. These power inequalities appear to reproduce the hierarchical structure present in the parent organization and characteristic of the U.S. cultural patterns of competitive individualism and scientific rationalism.

© *copyright, A. Brooks, 1995*

BEST COPY AVAILABLE

Self-Directed Teams And Team Effectiveness Training

The notion of self-directedness is based on the belief that teams constitute discrete and unitary identities. They do not. Instead their boundaries are permeable, their membership fluid, and their culture a reproduction of the parent organization.

An important, but faulty assumption supporting the notion of self-directed teams is that teams have unitary and distinct identities and clear boundaries separating them from their environments. However, a close look at the teams I studied showed team members joining and dropping out on a regular basis; a lack of clarity about the purpose of the team; a lessening of team identity outside of the team meetings; and outside events profoundly influencing both the teams' purposes how team members interact with each other. This suggests that teams are so integrated with their organizational context, they inevitably reflect the culture and structure of that organization. If the organization is predominantly hierarchical, teams reproduce that hierarchy. If the organization excludes members of certain groups from full participation, the teams reproduce that behavior. This is not to preclude the resistance of certain individuals and groups to aspects of the predominant culture. However, it is to say that teams are so enveloped and colonized by the culture of the parent organization that they are incapable, except by an act of resistance, of doing anything but reproducing the culture of the organization. It is also to say that the type of education implicit in team training does not provide appropriate and useful tools to resist that culture. Teams, although part of the picture of what a transformed organization might look like, cannot within the current structure and culture of most organizations act counterculturally. They cannot be used to spearhead a transformational effort in organizations.

Team training assumes that the difficulties teams have in the U.S. are the result of team member skill deficits. This oversimplifies the complexity of teamwork in specific organizational contexts.

Prevalent in the practice and research literature about teams is the belief that team performance improves when the team competency of individual team members improves. An enormous body of research, literature, training packages and consultancies is part of a team-building industry based on this assumption. However, this view of teams problematizes team members. This problematizing is similar to the deficit model in public education that identifies certain individuals as "at risk" and then sets them aside for special treatment intended to "fix" them so as to have a better chance of success in the current public school system. This approach is based on the notion that a single definition exists for success and that all people, in order to be successful, need to conform to a specific set of standards. In the workplace, this approach fails to place value on individual talents that fall outside of the standard definition of qualities associated with success. In the Brooks study of four research and development teams, the most productive team in terms of both technical and social knowledge had had no team training as a group and was notable for its lack of traditional team skills (1994). The team included no managers or engineers and only the leader had any college education at all. It included a preponderance of shift workers. What did seem to distinguish the team was that team members believed that the work they were doing together was going to make an important contribution to the organization.

Teams are assumed to have a clear ideological mandate within organizations. They do not. Rather, organizations are a site of competing discourses and conflicting practices regarding teamwork.

It is through an understanding of teams from a cultural perspective that we can begin to understand the contradictions and paradoxes teams and team members encounter working in many of today's organizations. One can understand organizations as a panoply of competing discourses, many embodied in current buzzwords in management literature and providing the marketing edge for management training seminars. For example, today's managers are being taught to work on teams - a collective activity - while at the same time learning to manage their own careers - an individualistic activity. More subtly, there is the official discourse which eulogizes the pursuit of quality through teamwork, while the behavioral text of who gets promoted is often one of membership in an old boy network. The discourse of managing one's own career disguises the more terrifying discourse euphemistically called "downsizing" or "re-engineering," but understood by all as layoffs and firings. Finally, there is the attempt to integrate re-engineering with its radical elimination of nonproductive units with the quality-oriented and frequently time demanding efforts of teams working within the discourse of Total Quality Management.

These discourses often seem to contradict each other and to demand conflicting behaviors from the same employee. They are the product of a proliferating industry of management consultants and literature whose fundamental premise is that organizational culture can be controlled and changed through the use by managers of appropriate and effective change methodologies. These methodologies range from radical high control methodologies such as re-engineering reflecting cultural patterns of competitive individualism and scientific rationalism, to more participative methodologies such as Total Quality Management that take a more consciously countercultural position by stressing incremental quality improvement by those individuals closest to the work being done. Regardless, the resulting and often competing discourses, each making a claim to radically transform the way things are done in the organization, drown out the traditional cultural patterns with a cultural confusion that leaves employees afraid and cynical about the organization. Particularly contradictory for teams are the discourses and organizational structures and policies about competitive individualism versus cooperation, short-term financial returns versus quality improvement, and control and accountability versus participation and risktaking.

The Problem For Knowledge Producing Teams

For teams that produce knowledge, these conflicts are further complicated by an outmoded view of knowledge which oversimplifies the interrelationship between technical and social knowledge.

While all teams work within the kinds of paradoxes noted above, teams with the explicit purpose of producing knowledge struggle with a set of paradoxes best expressed in the following description of the modernist - post modernist controversy over the nature of knowledge:

> "The modernist belief is that knowledge can be scientifically studied and analyzed. The use of objective evidence forms the foundation for what modernists accept or reject. The postmodern world, however, is one that rejects the positivist definition of "objectivity" or that one singular "truth" exists that awaits to be discovered. Rather than a Durkheimian concept of reality that synthesizes knowledge and people to abstract norms, postmodernists focus on difference and conflict where competing interpretations of reality are inevitable. Thus, the researcher's task is not to discover the "true" interpretation, for none exists; instead the challenge is to uncover the multiple voices at work in society that have been silenced" (Tierney, 1994, 99).

In other words, postmodernism challenges the existence of an objective technical knowledge. Such a challenge should cause companies that base their success on the continual development of new technical knowledge to sit up and take notice. What would be the implications if the boundaries between technical and social knowledge were blurred?

Intel's experience with producing and marketing the Pentium chip provides an example of how technical and social knowledge are interwoven.

The case of Intel's recent difficulty with the Pentium chip provides an example of how technical and social knowledge are interwoven in ways that profoundly affect the company's financial success. An analysis in the December 17, 1994 Economist stated that the problem with the Pentium chip was not one of faulty engineering (the level of mathematical error in the chip was acceptable for the purposes of most PC users), but of a marketing campaign. Intel spent $150 million on what the Economist described as

> "two ambitious leaps in marketing, both unprecedented in an industry where chips were considered to be components whose make was of interest to manufacturers, not customers. First, it advertised its own name, with the ubiquitous "Intel Inside" campaign. Then, it went a step further and launched an $80 million campaign to promote the Pentium itself, hoping to speed the market's acceptance of the new chip. It was largely thanks to this campaign that the Pentium's flaws became newsworthy" (p65).

Ironically, the fault with the Pentium was apparently not significant and was quickly repaired. Intel estimated that a single user would stumble across two numbers that cause the division problem only once every 27,000 years. However, IBM argues that some users might encounter an error once a month and announced it would halt shipments of Pentium PCs. Other computer manufacturers, such as Dell, continue to sell Pentium-PCs on the grounds that as Intel claims, this is not a problem the average computer user needs to worry about. The Economist analysis continues:

"Rather than dismiss the Pentium problem as unimportant to most users, Intel should have promptly released a cure, either a software program that would work around the problem or a more generous recall programme (currently, the company will replace a chip only if you claim loudly that you are at risk of being affected by the error). It should also have been less hyperbolic in trying to diminish the problem's significance; regardless of which is right, once every 27,000 years sounds unconvincing next to IBM's estimates of monthly troubles. And all these questions still lead back to the broader issue: should Intel have hyped its brand to the consumer at all?"

Although little discussion appears to be occurring in organizations themselves about the nature of knowledge, the Pentium case exemplifies how knowledge can no longer be thought of as a single technical narrative, but a site of competing interpretations of technical reality interwoven with social reality

Thus, whether or not a chip can be considered "acceptable" is not just a technical question, but a social one, as well. If Intel had not hyped its brand to the consumer, a slightly flawed chip would have been acceptable, as Deli concluded. When we begin to consider the exigencies of context, we have entered the realm of social knowledge. Thus, in this example, technical knowledge is intimately married to social knowledge and as interpretive social science has taught us, social knowledge is open to interpretation. In a postmodern era, the possibilities for different interpretations are multiple, and each of these interpretations reflects the positioning of the interpreter. Unfortunately, we have become accustomed to searching for and accepting a single grand truth and uncomfortable with the possibility of a more complex, unpredictable and multifaceted reality. When a single grand truth is allowed to dominate, it is the interpretation of the person or group who command the most formal and informal power. In other words, a single grand truth inadequately represents reality and when one truth prevails in public, it is usually the truth as seen by those who command the most formal and informal power. Although a single interpretation is allowed to dominate as truth, other interpretations do not just disappear, but remain silent, acting as sources of alienation for those who were not heard. This is a serious problem in terms of team effectiveness, and in terms of knowledge production, valuable information is lost to the process.

Discussion And Implications For A Knowledge And Information Society

Knowledge production benefits from a rich exchange of information and interpretation.

Teams that produce knowledge, even technical knowledge, are seriously disadvantaged when the knowledge production process is an exclusive one. In particular, hierarchical organizations are disadvantaged when the perspectives of those with low formal or informal power are excluded from the conversation. In hierarchical organizations in which the dominant cultural patterns are competitive individualism and scientific rationalism, team members are incapable, except by acts of cultural resistance, to interact with each other in ways different from those characteristic of the cultural patterns of the parent organization. This means that members with low formal or informal power lack value in the eyes of more powerful team members and are able to contribute less to the knowledge production process than their more powerful team mates. If we understand knowledge, even strictly technical knowledge, to involve interpretations of reality, and we understand the inextricability of technical and social knowledge, then our work as knowledge producers can only be enhanced by the illumination of as many interpretations of reality as available. Since our own interpretation can only reflect our own position and history, it is to our own advantage that we seek out and try to understand the interpretations of others.

Work with information is severely constrained by power inequalities among workers.

At some level as a nation, we seem to have understood this. Our attempts to utilize cross-functional teams and to move organizations to team-based structures attest to this. However, we seem to have underestimated the profound impact of the parent organization's structure and culture on the functioning of teams. We seemed to have believed that with a little training, teams would be able to function effectively. We did not consider that the very act of successfully functioning as team members would be countercultural or at odds with the dominant culture in several ways: (a) full participation of all members in the team dialogue is at odds with participation according to position in the formal and informal hierarchy of the organization; (b) team compensation is at odds

BEST COPY AVAILABLE

with the individually-based compensation still existing in most organizations; (c) workers' control over their own movement and use of time is at odds with the tight control held by most supervisors accountable to their managers in hierarchical organizations; (d) easy access to information throughout the organization is at odds with access only to information within the workers' immediate scope of work; and (e) respect for experience-based knowledge is at odds with an over-valuation of professional knowledge.

If this is true, then what should we do?

Since teams are countercultural to the dominant cultural patterns in the United States in the late 20th Century, we must think about their use as an attempt to transform the nations' traditionally dominant culture. How is it that culture can be transformed? The way that is typically used in organizations is for top level management to decide what that culture should look like and to initiate an appropriate series of structural and cultural changes in the organization. The attempt to institute teams as the primary unit of work and management is just such a change.

However, culture is the collective construction of its members. To change culture requires not for top leaders to issue an edict, but for those who are members of the culture to come to a new understanding of how things work. This occurs over many years and top leadership is only a part of the process, not in control of it. There are two ways that seem likely to result in a changed collective understanding of how things work. One is for multiple conversations or dialogues to occur which include diverse and competing interpretations. The result of these is not intended to be a consensus but rather an enhanced understanding of the experiences of those who constitute a culture's membership. These conversations or dialogues can occur anywhere in organizations, but their success is predicated on contribution of diverse perspectives. There is no normative goal for these dialogues since what emerges cannot be predicted. Although these dialogues are educational in nature, they are not intended to educate in the sense of teaching the norms, values, and content knowledge of the existing culture. Like education at its best, they can occur anywhere. Anyone who seeks to educate can sponsor an environment in which such exchanges can occur. The other way that we can begin to change our collective understanding of how things work is to develop a critical awareness of the dominant culture in which we live. This does not mean learning the culture as a universal given, but learning the ways in which our thought and actions are a product of that culture. Both dialogue and critique suggest educational directions capable of helping in the collective transformation of culture. They stand in contrast to the overly simplistic and mechanistic interventions of mandated teamwork and traditional team effectiveness training.

References

Allen, T. J. (1984). Managing the flow of technology transfer: Technology transfer and the dissemination of technological information within the R&D organization. Cambridge, MA: MIT Press.

Ancona, D. G., & Caldwell, D. F. (1990). Information technology and work groups: The case of new product teams. In J. Galegher, R. E. Kraut, and C. Egido (eds.), Intellectual Teamwork (pp. 173-190). Hillsdale, NJ: Erlbaum.

Austin, A. E. & Baldwin, R. G. (1991). Faculty collaboration: Enhancing the quality of scholarship and teaching (Ashe-Eric Report No. 7). Washington, DC: George Washington University.

Brooks, A. K. (1994). Power and the production of knowledge: Collective team learning in work organizations. Human Resource Development Quarterly, 5(1), 213-236.

Cicourel, A. V. (1987). Cognitive and organizational aspects of medical diagnostic reasoning. Discourse Processes, 10, 347-367.

Cicourel, A. V. (1990). The integration of distributed knowledge in collaborative medical diagnosis. In J. Galegher, R. E. Kraut and C. Egido (eds.) Intellectual Teamwork (pp. 221-242). Hillsdale, NJ: Erlbaum.

Dechant, K., Marsick, V. & Kasl, E. (1993). Toward a model of team learning. Studies in Continuing Education, 15 (1), 1-14.

Kraut, R. E., Egido, C. & Galegher, J. (1990). Patterns of contact and communication in scientific research collaborations. In J. Galegher, R. E. Kraut, and C. Egido (eds.), Intellectual Teamwork (pp. 149-172), Hillsdale, NJ: Erlbaum.

Larson, J. R. & Christensen, C. (1993). Groups as problem-solving units: Toward a new meaning of social cognition. British Journal of Social Psychology, 32, 5-30.
Pelz, D. C. & Andrews, F. M. (1966). Scientists in organizations. New York: Wiley.
Tierney, W.G. (1994). On method and hope. In A. Gitlin (ed.), Power and Method (pp. 97-115), London: Routledge.

Successful Teams, But at What Level? An Evaluation Model of Team Success at an International High Technology Firm

Oma Morey
University of Texas at Austin

With the continued expansion of teams in organizations, we are still puzzled as to why some succeed and others fail. Evaluating team success is difficult, however, if key stakeholders disagree on the definition of success. This study examines how different stakeholders within an organization define success. Eight teams and their managers participated in a case study. From a comparison of team success literature and each group's perception of success, a team success model was developed.

American organizations continue to move to team-driven cultures. In fact, the excitement for developing team approaches to work is so strong that it might be considered a fad in modern management philosophy (Stevens & Campion, 1994). In a survey conducted by the Association for Quality and Participation, forty-seven percent of the managers who responded indicated that more than half of their workforce will be organized into self-directed work teams within the next five years (Verespej, 1990). Money, time, and effort go into training and building systems to encourage team success, yet many organizations still struggle to make teams succeed.

One of the major reasons organizations adopt team-based approaches to decision making is the empowering effect it has on employees. Writers often propose that team involvement in decision making increases commitment and improves quality, yet team research results are mixed. Some reviews state that there is little empirical evidence on the overall effectiveness of team-based work programs (Kahnweiler, 1991). Others cite studies that contradict or refute previous findings on team effectiveness (Kanekar, 1983). Successful work teams have been able to reduce costs, improve quality, improve morale, and respond effectively to customer needs (Beer, Eisenstat, & Spector, 1990). Wagner and Gooding (1987), however, found that teams had only a modest influence on performance, decision making, motivation, member satisfaction and acceptance. In a review of the team development research, May and Schwoerer (1994) concluded that there was a correlation between teams and improved attitudes but found less support that team structures actually improve performance. Lawler (1986) argues that work teams are not always the best approach for completing a task. This may be why some organizations' team initiatives fail.

Part of the problem may also be due to a lack of congruency in how organizations and key stakeholders define success and factors that enable team effectiveness. Stakeholder groups include team members, their supervisors, their direct line managers and anyone else that has a stake in the results of the team process. It is conceivable that each of these groups may have a different perception of what constitutes success. It is difficult to evaluate team success if everyone is approaching the evaluation from different frames of reference. Therefore, the stakeholders need to understand and agree on factors that define a successful team (Goodman, Atkin, & Ravlin, 1982).

Many researchers and organizational specialists have attempted to develop the perfect recipe for an effective or successful team. Yet the exact formula still eludes them. Comprehensive models for group effectiveness have been developed (Gladstein, 1984, May & Schwoerer, 1994; Sundstrom, De Meuse, & Futrell, 1990), as well as taxonomies outlining essential knowledge, skills and abilities of team members (Stevens & Campion, 1994). Factors critical to team success often cited in the literature typically fall into the following categories: organizational and

© copyright, O. Morey, 1995

management support, systems support, team structure and process, individual characteristics, and interpersonal competence.

Organizational and Management Support

The literature often cites organizational and management support as major factors in team success (Berrey Avergun, & Russ-Eft, 1993). Blanchard (1990) believes an organization's commitment of time, resources, and training drives team effectiveness. Several writers posit that success is dependent on the organization's ability to create a clear vision and mission, and then align the teams' missions and goals with the organization's mission and goals (Arajs, 1991; Merron, 1994). Others credit success to management's commitment to high employee involvement, and their ability to remove barriers to employee involvement and team empowerment (Arajs, 1991; Bergstrom, 1994; Giordan & Ahern, 1994; Green & Hatch, 1990).

Effective organizational communication is also a major factor in team success. Management needs to foster an atmosphere of open and effective communication throughout the organization (Green & Hatch, 1990). Teams need access to data necessary for accurate decision making (May & Schwoerer, 1994). Mink, Mink, and Owen (1987) advocate that open organizations allow information to flow freely. This information exchange is critical in building trust, and trust is an essential component of team success.

The literature stresses the manager's role as coach in encouraging and supporting creativity, risk-taking and learning (Ashley, 1993; Barton, 1991; Berg, 1991; Blanchard, 1990; Coe, 1992; Davis, Corbin, Stabler, & Weller, 1992; Deeprose, 1992). Bushe and Johnson (1989) posit that managers need to make sure team members view their role as important. Several writers postulate that managers need to have good communication skills and strong interpersonal skills (Ashley, 1993; Klassen, 1993; Lewis, 1993; McClure & Werther, 1993). Ashley (1993) proposes that a manager's nontechnical skills including leadership, communication, and interpersonal relationships are important components in team success. He found these skills particularly difficult for engineers transitioning into supervisory roles. He outlined the following management skills as critical to team success: (1) coaching for optimal performance, (2) increasing individual productivity through teamwork, (3) running interference and interfacing with the organization, and (4) facilitating self-management within the team. Manz and Sims (1987) suggest that managers encourage their teams to become self-managing through self-observation and self-evaluation. Still other writers theorize that there is no one right style of leadership, but that the leaders should take a more situational approach. Barry (1991) argues that teams at different stages of development need different types of leadership. These types of leadership include envisioning, organizing, spanning outside the group, and social development of the team.

Systems Support

The literature also emphasizes the need to implement support systems that encourage and promote the team development (Sorohan, 1994). In their model of team effectiveness, May and Schwoerer (1994) propose that two systems affect team success. They stress that organizations need to provide education and training that incorporates job-related simulations and controlled feedback. They also urge organizations to adopt reward systems that compensate for skills members acquire. Hackman (1986) agrees that team effectiveness depends on an organizational context that supports competent teamwork through rewards, education, and information. Several writers support team compensation systems such as multi-skilling or skill-based pay (Denton, 1992; Dobbelaere & Goeppinger, 1993, May & Schwoerer, 1994). Other systems potentially affecting team effectiveness include: reward and recognition systems (Ball, 1993; Blanchard, 1990; Green & Hatch, 1990; Hackman, 1986, May & Schwoerer, 1994; Sundstrom, et. al.,

1990), and team involvement in member selection, scheduling, and evaluation (Barton, 1991; Dobbelaere & Goeppinger, 1993; Ferris, 1991).

Team Structure and Team Process

Team process and structure also impact team success (Gladstein, 1984, Katz, 1982). Gladstein postulates that group structure, such as group size, group norms, member roles and goal clarity, indirectly influence team effectiveness. She defines group process as "the intragroup and intergroup actions that transform resources into a product" (Gladstein, 1984, p. 500). Hackman (1986) also posits that effective teams have a clear and engaging direction, and a structure that enables competent work.

Having the right skill mix on the team may also facilitate team effectiveness (Bushe & Johnson, 1989). In a study of cross-functional change teams, Katzenbach and Smith (1993) discovered that successful teams tended to have adequate levels of complementary skills. Pearce and Ravlin (1987) attribute team success to team member heterogeneity. Some organizations use screening processes to develop teams. They look for cooperative interpersonal behaviors, dependability, integrity, and the right technical skills (Flynn, McCombs, & Elloy, 1990). Recent work indicates that personality-based selection systems may be capable of having some modest effect on success (McClure & Werther, 1993). Harris and Harris (1990) posit that team success increases when team members understand multiple team roles. Several organizations have improved the morale and efficiency of teams by cross-training employees (Denton, 1992; Scott & Townsend, 1994).

A clear compelling mission or purpose is an integral factor in team effectiveness (Gladstein, 1984; Hackman, 1987; Koller, 1989; Sundstrom, et al, 1990). Katzenbach and Smith (1993) note that effective teams take time developing a purpose and then translating that purpose into specific performance goals. Goals need to be challenging but not unattainable (Stevens & Campion, 1994). All team members should understand and commit to team goals (Francis & Young, 1979; Imundo, D'O'Brian, Williams, & Milite, 1992; Lawson & LaFasto, 1989).

Often, the main function of a work team is to solve problems. Therefore, to be effective, team members should be able to identify problems, ensure that all members' ideas are considered, utilize problem solving principles, and adopt solutions that are supported by concrete reasoning (Stevens & Campion, 1994). Hackman (1986) suggests that members of mature teams take personal responsibility for their results, monitor their performance and progress though feedback, take corrective action if needed, and actively seek assistance and guidance from the organization. Teams also need to develop an open, supportive atmosphere where creative problem solving, risk taking, and learning can flourish (Francis & Young, 1979; Imundo, et. al., 1992; Koller, 1989).

Individual Characteristics and Interpersonal Competence

The effectiveness of a team depends heavily on its members' level of maturity and interpersonal competence (Gooley, 1993; Nurick, 1993). The team success literature emphasizes several individual factors that impact team success. Technical or functional expertise is frequently mentioned (Gooley, 1993; Koller, 1989). Ferris (1991) identified individual and group characteristics that play a major role in team success. Individual characteristics included dependability, interpersonal skills, self-motivation, and integrity. Group characteristics identified were leadership potential, assertiveness, participation, and the ability to cope with role ambiguity.

Team effectiveness also depends on team members' ability to successfully handle interpersonal relations. Stevens and Campion (1994) identified three levels of interpersonal knowledge, skills, and abilities that promote team effectiveness: (1) conflict resolution; (2) collaborative problem solving; and (3) communication. Other important characteristics include

member participation, commitment, and accountability (Gooley, 1993; Koller, 1989; Scott & Townsend, 1994). Gooley (1993) posits that teams are more effective when members share responsibilities and duties, believe in one another, and share commitment. Mink, Mink, and Owen (1987) outline five norms that facilitate team development: (1) developing trust, (2) accepting and recognizing individual differences, (3) giving and receiving feedback, (4) problem solving, and (5) letting go of the past.

Effective team communication is characterized by team members' willingness to be open and receptive to information, ideas, and feelings of others (Campion, Medsker & Higgs, 1993; Gladstein, 1984; Pearce & Ravlin, 1987; Stevens & Campion, 1994). Therefore, team members need to communicate openly and supportively, listen actively and nonjudgementally, and understand and interpret nonverbal messages (Stevens & Campion, 1994).

Many problems arise when organizations try to bring a group of people together who have a wide range of personalities, expectations, experiences, and knowledge to create a team (Caudron, 1994). Conflict is a fact of group experience. Personnel and personality conflicts frequently hinder team development (Manz, Keating, & Donnellon, 1990; Verespej, 1990). Therefore, team members' willingness and ability to resolve personal conflict is crucial to team success (Hequet, 1994; McClure & Werther; Nixon, 1993; Nurick, 1993). McClure and Werther (1993) found that interventions based on personality assisted teams in identifying and resolving personality-based barriers by improving interpersonal communication and team building.

There is extensive literature on team success factors available to organizations transitioning to a team-based culture. Many of the factors identified overlap or complement each other. There is a wide array of consultants offering different approaches to team development. Some skills taught are standard team skills, but different consultants may focus on different skills or approaches. These differences may influence an organization's perception of success factors. Therefore the problem this study addresses is that there is no consistent definition of success factors for teams. When evaluating the success of teams, it is critical that key stakeholders in the organization have a clear and common understanding of team success factors. This study will examine how key stakeholders in an organization define success. It will also look at enablers and constraints to team success.

Participants

The study took place in three separate manufacturing units of a high technology firm. All of the units are located in the same city. The manufacturing units are open twenty-four hours a day, seven days a week. For the last several years, the organization has been shifting from a more traditional management-led culture to a team-based culture. Most of the non-exempt employees in the manufacturing units have attended an extensive team skills workshop. Many of the managers also have attended. Some managers have been through an intensive team skills class. Others have not yet attended.

The teams were intact work units. The team makeup included the supervisor, or in some instances the manager, and their direct reports. Most of the teams include support staff and engineers. Different teams performed different functions in the manufacturing process. Therefore, team size and makeup varied.

Methodology

Since this study was designed to examine team success from the participants' points of view, a qualitative case study design was used. Bromley (1986) postulates that case studies "get as close to the subject of interest as they possibly can, partly by means of direct observation in natural settings, partly by their access to subjective factors (thoughts, feelings, and desires)" (p.23). A qualitative case study is a "holistic description and analysis of a bounded phenomenon such as a program, a process, a person or a social unit. Its purpose is to reach a comprehensive

understanding of the groups being studied and to develop general theoretical statements about patterns occurring in their structure and processes" (Becker, 1968, p. 233).

This study utilized a four-step qualitative case study. The four steps included (1) determining factors that characterize a successful team; (2) selecting a case study sample; (3) collecting data; and (4) analyzing data.

Determining Factors that Characterize a Successful Team A preliminary understanding of team success factors is critical in framing this case study. Therefore, the first step involved searching relevant team success literature. A thorough understanding of previous research and theory and current practices in the field assisted in conceptualizing the problem, conducting the study, and interpreting the findings.

To gather preliminary data, an open-ended questionnaire was sent to all first line managers in the manufacturing units and members of twenty-two intact teams asking them to define the characteristics of a successful team. Over sixty percent of the questionnaires were returned. This data was compared to relevant team success literature and the organization's team award criteria. A comparison chart was constructed indicating similarities and differences between the literature, the managers' perspectives of success, and team members' perspectives of success.

Selecting a Case Study Sample Through a stratified purposeful sample, eight teams were selected to participate in the case study. Stratified purposeful samples are used to study above average, average, and below average cases. As Patton (1990) writes, "The purpose of a stratified purposeful sample is to capture major variations rather than to identify a common core, although the latter may also emerge in the analysis" (p.174).

Training coordinators and team facilitators identified three teams in each manufacturing unit: one mature team perceived as "successful," one younger or newer team perceived as "successful" or as a "rising star," and one mature team perceived as "struggling" or "not yet achieving success". Predetermined criteria or success categories were not offered since one objective of this study is to determine and compare different stakeholders' perceptions of team success factors. Therefore, anyone identifying a "successful" or a "struggling" team was asked to explain their criteria for the selection.

Data Collection Data collection procedures included observations of team meetings and interviews with team members, supervisors and managers. Observations spanned over several months and focused on specific behaviors, interactions and patterns. A behavioral checklist was developed and tested for instrument validity and observer rater reliability. Observers attended four team meetings for each team identified.

After completing the observations, interviews were scheduled with team members, their supervisor, and their first and second level managers. A standardized open-ended interview format was used.

Data Analysis A cross-case inductive analysis elucidated common themes or categories of success factors. This evolved into a three-tier team success model. The model, shown in Figure 1, outlines the three success levels and specific identifying characteristics of each level. It is important to understand that the emphasis of qualitative data analysis is on "illumination, understanding, and extrapolation rather than causal determination, prediction, and generalization" (Patton, 1990, p. 424). Therefore, this study provides a holistic snapshot of work teams and their perceptions at the time of the study.

The Team Success Model

The comparisons of team success literature, managers' perceptions of team success factors, and team members' perceptions of team success factors led to the development of a team success model. The model depicts three levels of team success: (1) the individual and interpersonal level, (2) the team process level, and (3) the management and systems support level.

Level 1 Individual and Interpersonal Success Factors The individual and interpersonal level included success factors related to individual team member characteristics and their ability to relate interpersonally. The individual and interpersonal characteristics mentioned most

Figure 1 Levels of Team Success

LEVEL 3 - SUPPORT

MANAGEMENT

Action support their words
Follow-through on commitments
Full empowerment -
Gives responsibility & authority
Actively supports team
Effective interpersonal skills
Open and willing to change
Values everyone's contributions regardless of level/title

SYSTEMS

Permeable boundaries
Monetary team rewards
Consistent delivery of rewards
Team selects & reviews team members
Team structure maximizes individual needs, personality, potential, and desires.

LEVEL 2 TEAM PROCESS

Well defined boundaries
A clear focus on mission
Specific goals
Like each other & have fun
Keep meetings on track
Handle problems as they arise
Strong group facilitation skills
Uses meeting ground rules
Draw information from each other
Know how fit into the organization

LEVEL 1 INDIVIDUAL / INTERPERSONAL

Confronts conflict and is open to working it out
Supports other team members and team goals
Understands and resects individual differences
Flexible - open and willing to change
Open honest communication

BEST COPY AVAILABLE

frequently were: cooperation, team member support, open and honest communication, and team member commitment. Participants felt that a team member should be able to commit 100 percent, both to the team and to the job. They should also be willing to address conflict within the team.

Level 2 Team Process Factors Team process factors include the team structure and any skills team members use in the process of getting their job done. Specific skills identified as important were effective meeting management skills, facilitation skills, and problem solving skills. Teams should be structured so they have well-defined boundaries. They should understand how much power they have over decisions about their job. The team should also have a clear mission and specific goals to guide their process. They should know how their team fits into the organization's strategic plan. Team members should develop their own ground rules and use them in their meetings.

Level 3 Support Factors The support level is divided into management support and systems support. Many of the study participants had negative experiences with upper management in the past, possibly influencing their responses. Therefore, the management support characteristics identified most often were following through on commitments and making their actions match the words they espouse. Managers should be willing to change management styles and give teams full empowerment. Team members believed that a team could not succeed it they were given responsibility but were not given the authority to carry it out. Managers should also exhibit effective interpersonal skills. They should communicate openly and honestly, listen and try to understand other's viewpoints, and value everyone's contributions regardless of their title or level in the organization.

System support factors include any systems or policies that would facilitate or hinder team effectiveness. Many organizational systems create barriers to team success (Sorohan, 1994). Case study participants stated that intergroup conflict and competition were major problems. They blamed these problems on the organization's structure and divisions within the structure. Accordingly, they felt that successful teams would have permeable boundaries allowing communication and sharing between work groups. The only other system support factor that seemed important to the participants was the need to have a monetary team reward system that encourages cooperation instead of competition.

Discussion

A team may be perceived as successful at one level or any combination of levels depending on how the stakeholder group defines success factors. One stakeholder group may perceive a team as successful at the same time another stakeholder group perceives it as struggling. This may be the result of their different perceptions of success. For example, the manager may view the team as unsuccessful because they are struggling with the problem-solving process and are slow to produce results. The team members, however, believe they are successful because they have overcome interpersonal conflicts and are now better able to focus on the task. The team was successful at the individual and interpersonal level but not at the team process level. The manager's perception of the team could negatively affect them if the team is not recognized for the success they achieved. The team may now move forward in process level skills since interpersonal conflicts were resolved.

In looking at similarities and differences between the literature on team success factors and stakeholders' perception of successful teams, it appears that the stakeholder groups identified many of the same factors discussed in the literature. The major difference between each stakeholder group's definition of success is the category each emphasized. From the responses, it would appear that managers place the greatest degree of importance on team process skills. This may reflect skills that were emphasized in training. Most of the managers had been through team skills training and many had attended facilitator training. Managers also placed a high degree of importance on management and organizational support. The ability to use specific problem solving processes did not seem to be as important to teams. The case study teams rarely

used the problem solving techniques and tools learned in training. All of the organization's stakeholders stressed the importance of meeting management skills which was only minimally mentioned in the literature. The case study results supported the stakeholders' views. All observed teams consistently used agendas, kept team minutes, and took on such roles as facilitator and scribe.

Although the literature emphasized system support, the stakeholders only mentioned a few system support factors. The only one identified by both managers and team members was the need to have more permeable boundaries between work groups in different parts of the organization. Managers also mentioned team reward systems and peer review evaluations.

According to the literature and the stakeholder groups, team communication is an important success factor. Managers, however, stressed the importance of the team's communication with management. Team members stressed the importance of lateral or cross-shift communication.

The greatest difference among stakeholders' perceptions of success is the emphasis teams placed on individual and interpersonal factors such as cooperation, commitment and communication. Case studies validated this concern. Many teams are still struggling at the individual and interpersonal level. It is also difficult for them to use the process skills learned in training if there is no trust among team members. It is difficult for teams to succeed at the team process level, if they are unable to communicate about their concerns or resolve interpersonal conflicts.

This has implications on the team success model. Although each of the three levels impact team success, success at one level may be contingent on success at another. It is difficult for these teams to move to a higher maturity state when individual team members are unable to get along. Therefore, teams that are most successful will most likely be successful at all three levels. However, teams can be successful at only one or two levels. Success at the individual and interpersonal level is critical. Success at other levels may not be sustained if the team is unable to work through issues that arise at this level.

Implications for Practice

What constitutes a successful team is slightly different for each of the stakeholder groups. This definition incongruency may be preventing the organization from accurately assessing the next steps needed in developing successful teams. Each stakeholders' definition needs to be taken into account. If a team is perceived as a failure by management's criteria but a success by their own criteria, the team members may experience confusion and disappointment. Also, teams may not realize that they need to change. It is imperative that key stakeholders are assessing success in the same terms, and that those terms are communicated to all stakeholders.

It is also important to realize that a team may be failing at one level of the model, but be highly successful at another. Team development interventions need to match the needs of the team. For example, if a team is struggling at the individual and interpersonal level, an intervention to improve their problem solving skills may have little impact on their effectiveness. The team success model may be used to facilitate team interventions. By having a more thorough understanding of the different levels of team success and factors that either enable or constrain success at each level, organizations can plan more appropriate interventions as they progress to a team-driven culture. The team success model that evolved from this study can also guide researchers in future studies on team success.

References

Arajs, B. K. (1991). Testing the teamwork theory. Graphic Arts Monthly, 63(6), 76.

Ashley, S. (1993). The making of an effective manager. Mechanical Engineering, 115(1), 61-63.

Ball, A. (1993). Coping with dysfunctional work teams. HRMagizine, 38(11), 131-132.

Barry, D. (1991). Managing the bossless team: Lessons in distributed leadership. Organizational Dynamics, 20(2), 31-47.

Barton, R. B. (1991). Group Dynamics. CIO, 4(12), 58-59.

Becker, H. S. (1968) Social observation and social case studies." In International Encyclopedia of the Social Sciences, Volume 11. New York: Crowell.

Beer, M., Eisenstat, R. A., & Spector, B. (1990). The critical path to corporate renewal. Harvard Business Review Press.

Berg, D. (1991). In defense of disorder, discomfort and discontent. Journal of Quality and Participation, 14(5), 50-53.

Bergstrom, R. Y. (1994). Teams: Dedicated players. Production, 106(3), 58-59.

Berrey, C., Avergun, A., & Russ-Eft, D. (1993). Highly responsive teams and your competitive advantage. Journal for Quality and Participation, 16(5), 72-76.

Blanchard, K. (1990). Molding a staff into a team. Today's Office, 25(4), 44-46.

Bromley, D. B. (1986) The Case Study Method in Psychology and Related Disciplines. New York: Wiley.

Bushe, G. R. & Johnson, A. L. (1989). Contextual and internal variables affecting task group outcomes in organizations. Group and Organizational Studies, 14(4), 462-482.

Campion, M. A., Medsker, G. J., & Higgs, C. (1993). Relationships between work group characteristics and efficiency: Implications for designing effective work groups. Personnel Psychology, 46, 823-850.

Caudron, S. (1994). Teamwork takes work. Personnel Journal, 73(2), 41-46.

Coe, C. K. (1992). The MBTI: Potential uses and misuses in personnel administration. Public Personnel Management, 21(4), 511-522.

Davis, R. M., Corbin, J. M., Stabler, J. D., & Weller, C. G. (1992). The planned evolution of a team culture. Journal of Quality and Participation, 15(1), 24-31.

Deeprose, D. (1992). Team leader or unit boss: Which do you want to be? Supervisory Management, 37(7), 3.

Denton, D. K. (1992). Multi-skilled teams replace old work systems. HRMagizine, 37(9), 48-56.

Dobbelaere, A. G. & Goeppinger, K. H. (1993) The right way and the wrong way to set up a self-directed work team. Human Resources Professional, 5(3), 31-35.

Ferris, F. D. (1991). Labor relations: A conflict gap. Bureaucrat, 20, 47-51.

Flynn, R., McCombs, T., & Elloy, D. (1990). Staffing the self-managing work team. Leadership and Organizational Development Journal, 11(1), 26-31.

Francis, D. & Young, D. (1979). Improving work groups. San Diego: University Associates.

Giordan, J. & Ahern, A. M. (1994). Self-managed teams: Quality improvement in action. Research-Technology Management, 37(3), 33-37.

Gladstein, D. L. (1984). Groups in context: A model of task group effectiveness. Administrative Science Quarterly, 29, 499-517.

Goodman, P. R., Atkin, R., & Ravlin, E. (1982). Some observations on specifying models of group performance. Paper delivered at a symposium on Productive Work Teams and Groups, American Psychological Association Convention, Washington DC.

Gooley, T. B. (1993). Team spirit. Traffic Management, September, 14S-16S.

Green, F. B. & Hatch, E. (1990). Involvement and commitment in the workplace: A new ethics evolving. Advanced Management Journal, 55(4), 8-12.

Harris, P. R. & Harris, D. L. (1990). High performance team management. Leadership and Organizational Development Journal, 10(4), 28-32.

Hackman, J. R. (1986). The psychology of self-management in organizations. In M. S. Pallack & R. O. Perloff (Eds.). Psychology and work: Productivity, change, and employment. Washington DC: American Psychological Association.

Hackman, J. R. (1987). The design of work teams. In J. W. Lorsch (Ed.), Handbook of organizational behavior. Englewood Cliffs, N. J.: Prentice-Hall.

Hequet, M. (1994). Teams at the top. Training, 7-9.

BEST COPY AVAILABLE

Imundo, L. V., D'O'Brian, J., Williams, G., & Milite, G. (1992). Blueprint for a successful team: Making new hires members of the team; coming to grips with the non-teamplayer; when the team becomes too human. Supervisory Management, 37(5), 2-5,9.

Kahnweiler, W. M. (1991). A review of the participative management literature: Implications for HRD research and practice. Human Resource Development Quarterly, 2(3), 229-250.

Kanekar, S. (1983). Individual and group performance. Bombay India: The University of Bombay.

Katz, R. (1982). The effects of group longevity on project communication and performance. Administrative Science Quarterly, 27, 81-104.

Katzenbach, J. R. & Smith, D. K. (1993) The discipline of teams. Harvard Business Review, 71(2), 111-120.

Klassen, C. (1993). Improving quality means improving communication. Canadian Business Review, 20(2), 15-18.

Koller, A. M., Jr. (1989). Developing and managing a winning team. Manage, 41(3), 2-9, 31.

Lawler, E. E., III. (1986). High involvement management. San Francisco: Jossey-Bass.

Lewis, J. P. (1993). Building winning teams. Transportation and Distribution, 34(10), 32-34.

Manz, C. C., Keating, D. E., & Donnellon, A. (1990). Preparing for organizational change to employee self-management. Organizational Dynamics, 19(2), 15-26.

Manz, C. C. & Sims, H. P., Jr. (1987). Leading workers to lead themselves: The external leadership of self-managing teams. Administrative Science Quarterly, 32(1), 106-128.

May, D. R. & Schwoerer, C. E. (1994) Developing effective work teams: Guidelines for fostering work team efficacy. Organization Development Journal, 12(3), 29-83.

McClure, L. & Werther, W. B., Jr. (1993). Personality variables in management development interventions. Journal of Management Development, 12, (3), 39-47.

Merron, K. (1994). Creating TQM organizations. Quality Progress, 27(1), 51-54.

Mink, O. G., Mink, B. P., & Owen, K. Q. (1987). Groups at work. Englewood Cliffs, NJ: Educational Technology Publications.

Nixon, B. (1993) Dealing with difficulties and differences. Industrial and Commerce Training, 25(2), 3-7.

Nurick, A. J. (1993). Facilitating effective work teams. SAM Advanced Management Journal, 58(1), 22-27.

Patton, M. Q. (1989) Qualitative evaluation methods. Newbury Park: Sage.

Pearce, J. A. & Ravlin, E. C. (1987). The design and activation of self-regulating work groups. Human Relations, 40(11), 751-782.

Scott, D. & Townsend, A. (1994). Teams: Why some of them succeed and others fail. HRMagizine, August, 62-67

Sorohan, E. G. (1994). Managing teams. Training and Development, 48(4), 14.

Stevens, M. J. & Campion, M. A. (1994). The knowledge, skill, and ability requirements for teamwork: Implications for human resource management. Journal of Management, 20(2), 503-530.

Sundstrom, E., De Meuse, K. P., & Futrell, D. (1990). Work teams: Applications and effectiveness. American Psychologist, 15, 120-133.

Verespej, M. A. (1990). When you put a team in charge. Industry Week, 239(23), 30-32.

Wagner, J. A. & Gooding, R. Z. (1987) Shared influence and organizational behavior: A meta-analysis of situational variables expected to moderate participation-outcome relationships. Academy of Management Journal, 30, 524-541.